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PETROLEUM PUBLISHERS, INC.
W. C. MONROE—President and Editor
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RICHARD SNEDDON, Contributing Editor

FRED JONES, Chicago Manager
228 No. La Salle St., Chicago 1, Ill.
HOWARD F. McCLENAHAN—Cleveland Manager
402-1010 Euclid Bldg., Cleveland 15, Ohio
The McKeown Company—New York Representatives
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The Fundamentals of Hydraulic Fracturing

BY
RICHARD SNEDDON

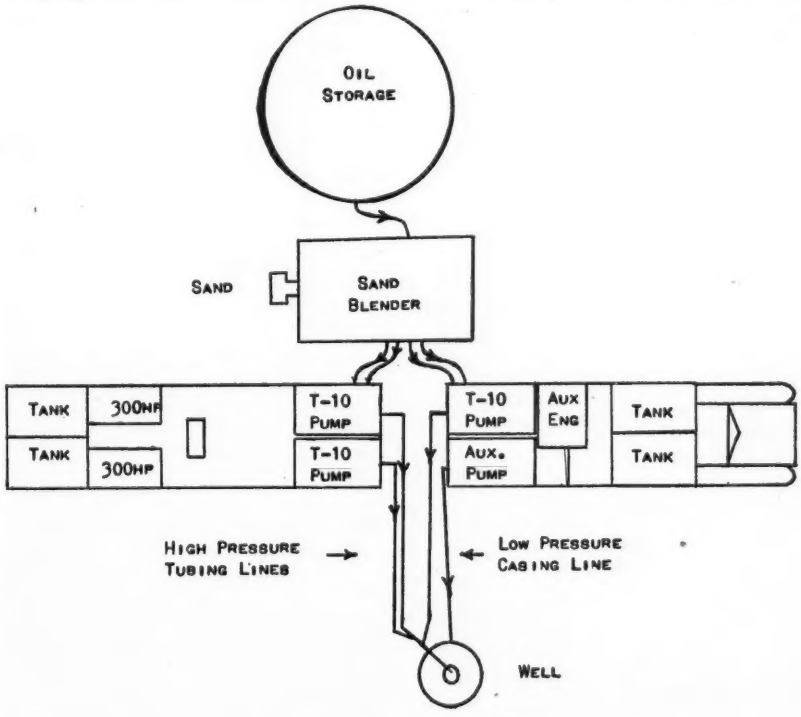
So thoroughly has the California sub-surface been probed and sounded in the immediate past by geo-scientists in search of oil that today even with highly improved exploration techniques and equipment and a more expansive knowledge of oil genesis and reservoir mechanics we are still unable to produce enough oil to satisfy the burgeoning demand. It thus becomes all the more necessary that the oil operator consider every morsel of pertinent scientific data and every adaptation of applicable process and device in order that he may be enabled to produce his successfully completed wells most effectively.

It has become a pretty well known fact that when a fair interval of producing horizon is being tapped in an oil well and the yield is discouragingly low, the reason for the low yield is quite commonly to be found in the character and condition of the oil sand. Some sands are so small-grained or their interstices are so reduced by the presence of extraneous material that they cling very tenaciously to such oil as they do contain. It is also to be noted that crude oil in subterranean **sites,** if we may scramble a Latin phrase, is sometimes so viscous that it just naturally moves slowly to the well face. In either case the result is the same—low volume time ratio—and the operator is faced with the choice of accepting his tough luck or attempting to do something about it.

There are two quite obvious courses that are open in such instances:

(a) To reduce the viscosity of the oil in the reservoir and so accelerate the process of migration.
(b) To enlarge the area of producing formation exposed and thereby increase the drainage to the well bore.

It is of the latter alternative that we propose to treat here: A number of years ago, Stanolind engineers studied this business of increasing production by exposing a greater area of producing horizon, and they eventually came up with the process, known as "Hydrafrac." The name means pretty much what it says, for the function of the process is to crack new channels or crevices into the face of the oil sand by the use of fluid at high pressure. In the meantime, the method has been modified in a number of ways to meet varying downhole conditions,



SCHEMATIC DRAWING SHOWING TYPICAL CONNECTIONS FOR A SANDOIL JOB USING 2 PUMPING UNITS AND 1 BLENDER.

but substantially it remains a matter of using a satisfactory fluid medium to fracture the formation face and injecting an easily permeable propping agent into the crevices to keep the newly exposed face open to production. Needless to say it is not quite so simple as the foregoing brief description would indicate. The choice of injection fluid, gel, if any, and propping agent, the requisite volume of the former and weight of the latter, and the pressures that may safely be employed for the injection, are all only determinable after a full analysis of the mechanical and physical characteristics of the well.

In the beginning, Hydrafrac was not successful everywhere it was employed but even in its earliest form it was sufficiently effective to excite the interest of production engineers in most of the producing areas of the United States. The process was licensed exclusively to Halliburton Oil Well Cementing Company in March, 1949. Since that time its use has expanded considerably and much worthwhile experience has been accumulated. The value of the process has been greatly enhanced by continuous research and five different procedures, applicable in a wide variety of conditions, have been responsible for increased production in numerous instances. The record actually shows an average of 175% of additional oil recovery in three out of four wells. A recent issue of a major oil company house magazine, discussing one of its Texas fields, and speaking specifically of hydraulic fracturing, states, "it is even more rare to find a process which will double the yield from every well in the field."

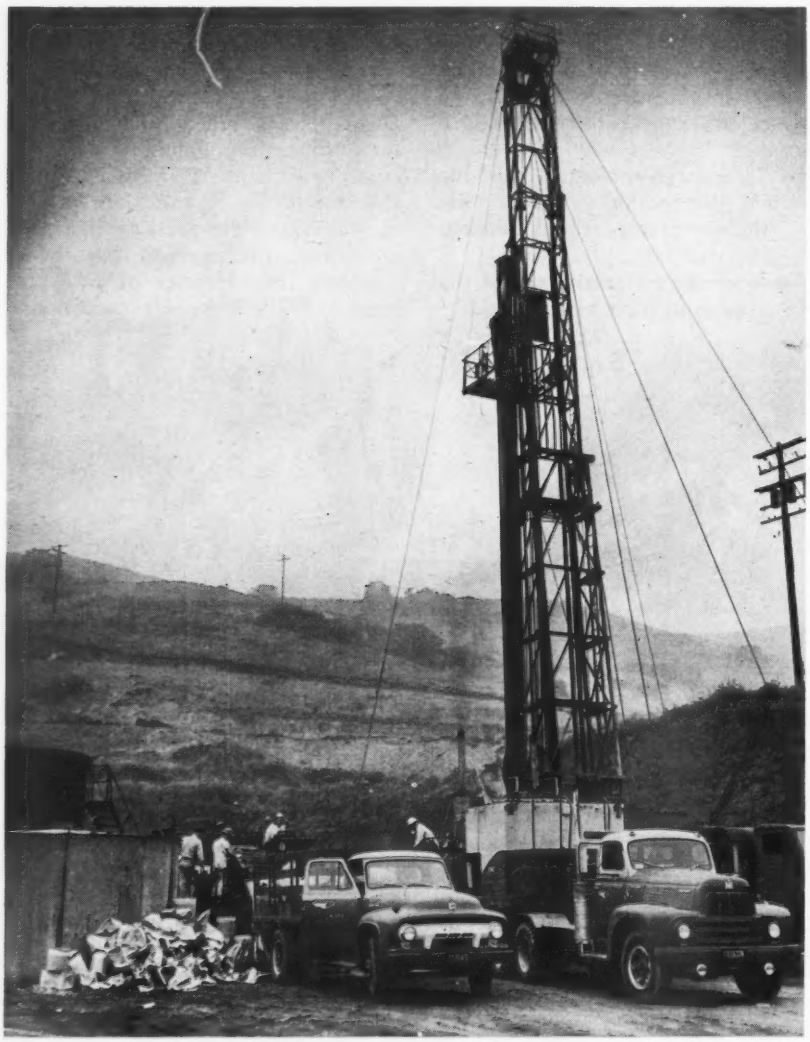
In this particular instance, 74 wells were originally producing a total of 24,000 barrels of oil per day from an extremely tight formation. Hydraulic fracturing was employed, involving the use of a sand-loaded gelatin to accomplish the fracturing and propping, and the total yield was boosted to 100,000 barrels a day, with the production rate on some wells being increased as much as 350 per cent. So successful was the whole enterprise, indeed, that in this field, hydraulic fracturing is now a routine part of the completion procedure on new wells.

Thousands of wells in all parts of the country have been subjected to the process with highly satisfactory results, and it can be said with conviction that it has been responsible for a substantial increase in production in the great majority of cases. One operator reports an increased yield of 65,000 barrels of oil from five wells in the first year of experimental application and this increase was still being sustained a full year later. Clark, Fast, and Howard, in a paper presented at the A.P.I. spring meeting of the Mid-Continent district in March, 1952, stated that during the first three years of commercial application over 75 per cent of the Hydrafrac treatments were successful in increasing well productivity.

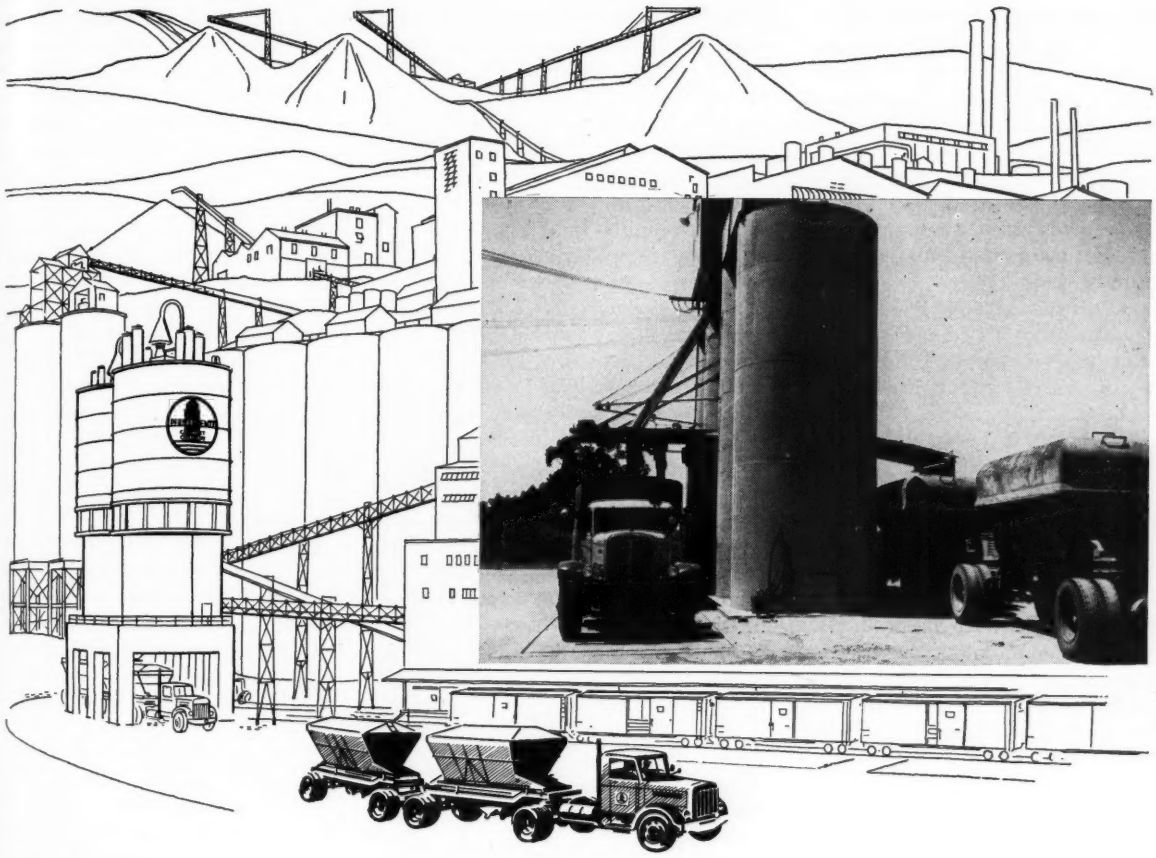
The method was first used commercially in California in 1952 when a total of 13 wells were treated for the year; in 1953, 31 wells were treated (9 with the use of sand-oil, which will be explained later); and this year to date 16 wells have been treated (5 using sand-oil). Indications are that usage will increase materially in the immediate future, since operators are becoming more and more conscious of the need for stimulating recovery by auxiliary means.

Looking now at the fundamentals of the formation fracturing process, there are certain elementary questions that immediately present themselves, as follows:

(1) Of what does the process consist?



Here is the front of the big pumping unit on the right. The blender and second pumping unit can be seen behind the stake bed truck that is used to furnish the sand. Oil for the sandoil job is stored in tanks on the left.



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(2) Where can it be used?
(3) What does it accomplish?

The few preceding paragraphs provide an answer to Question 3 but so far we haven't dilated very broadly on the other two. At the risk, therefore, of being repetitious let us point out again that the process involves three steps, as follows: (1) Fracturing the formation by injecting a sand-loaded, viscous fluid into the exposed area at high pressure. This fluid may be either water or oil base, usually the latter with the addition of gel to give the requisite viscosity, and the propping material, while ordinarily clean, round sand, may be any other equally effective bridging agent. (2) Breaking of the gel and displacement of the fracturing fluid from the newly opened producing area. (3) Final flushing out of the area by placing the well on production.

Up to the moment the fractionating liquids used have included gasoline, crude oil, kerosene, and other refined products some of which have been made sufficiently viscous by the addition of Napalm soap. The current preference seems to be for a light crude oil especially where it is actually produced by the well being worked on, because this eliminates the possibility of plugging the formation with a foreign fluid and consequently cuts the cost of the total operation. The injection is accomplished by two heavy duty pumps per unit each unit providing a total of 600 horsepower and capable of developing injection pressures up to 12,000 p.s.i.

The first step in the operation is to isolate as much as possible the producing zone by packing off and cementing where necessary. Then the fluid and the propping agent are thoroughly mixed and injected into the producing formation at a rate faster than it can be absorbed. This produces a sort of hydraulic jack effect that cracks the oil sand open. The success of California operations depends largely on an intimate admixture of fluid and sand, and recent developments include blending equipment to do this in a very effective way. The number of fractures and how far they penetrate into the formation is dependent on the type and volume of injection fluid used, and the sand concentration.

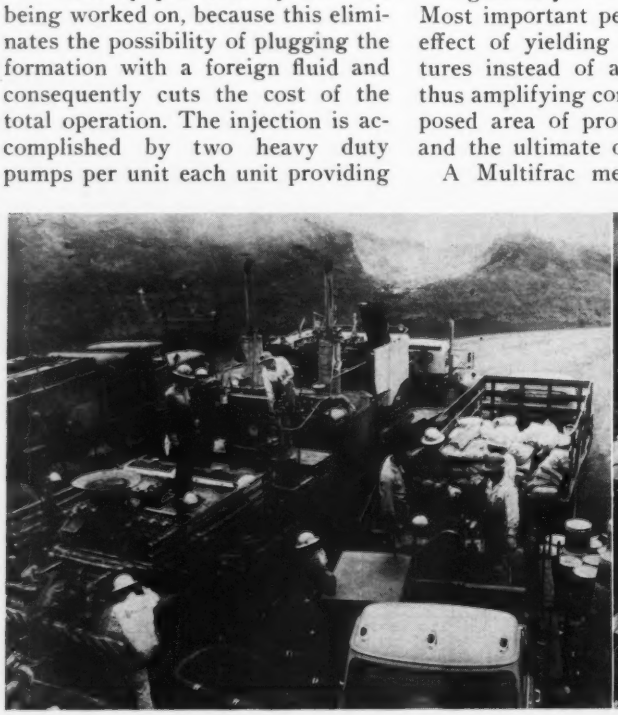
Gel-Kerosene was first used in order to keep the loss of fluid down to a minimum, but later a switch was made to viscous oil, such as heavy fuel oil, and tank bottoms, with no Gel. This became known as the sand-oil process and it permitted the use of larger volumes of fluid and generally lower cost operation. Most important perhaps, it had the effect of yielding a series of fractures instead of a single one, and thus amplifying considerably the exposed area of producing formation and the ultimate oil production.

A Multifrac method was developed, and has had considerable use, in which a sealing agent is employed to close off the fractures successively while the fluid pressure is utilized to crack additional channels into the formation. The sealing agent best adapted to California wells is naphthalene which performs its function adequately and is easily washed out when the operation has been completed.

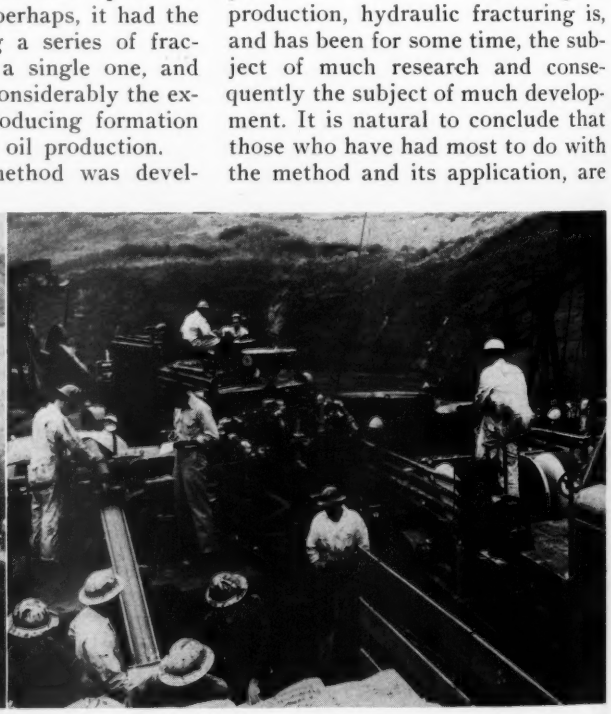
Early experimentation in California was with comparatively low sand concentrations, but more recent experience supports the use of greater amounts. The ordinary requirement is from 5,000 to 10,000 lbs. of sand per well, but runs as high as 150,000 lbs. in a single well have been recorded.

Referring back briefly to the contention that the sand-oil process results in multiple fractures, it may be mentioned that successive breaks can be distinctly identified on the regular time-pressure charts, and that they have been confirmed by the use of radio-active tracers.

Now answering Question 2: Where can hydraulic fracturing be used? It is well in the beginning to realize that like any other effective process or device for increasing oil production, hydraulic fracturing is, and has been for some time, the subject of much research and consequently the subject of much development. It is natural to conclude that those who have had most to do with the method and its application, are



Top View of Sand Blender in operation and twin high pressure pumps on the Lo-Boy. Engines behind the operator are 300 hp Cummins Diesels.



The blender on the left is pulling oil from a stock tank and accurately blending with sand. Big pumps on Lo-Boy trailer, on the right, are pumping the sand and oil into the tubing. Truck in background is pumping in the tubing with one pump and pressuring the casing with the second.

best equipped to tell where and when it can be employed advantageously. Also, it is a fair assumption that operational techniques, involved equipment and general know-how of hydraulic fracturing in all its ramified phases, are advancing so rapidly that the limit of application is far from being well defined. Every hydraulic fracturing job must be preceded by a thorough, searching analysis of sub-surface data, and an equally thorough examination of well production routine and equipment. Thereafter, a qualified and experienced engineer must determine the kind and volume of fracturing liquid to be used; the concentration of sand that should prove most effective; the rate of injection and the ultimate pressure to be employed; what steps must be taken to isolate as much as possible the significant interval; and in general to organize logically the entire plan of action. Cost of the operation may be reduced, incidentally, if analysis shows the oil produced by the well is satisfactory as a fracturing medium.

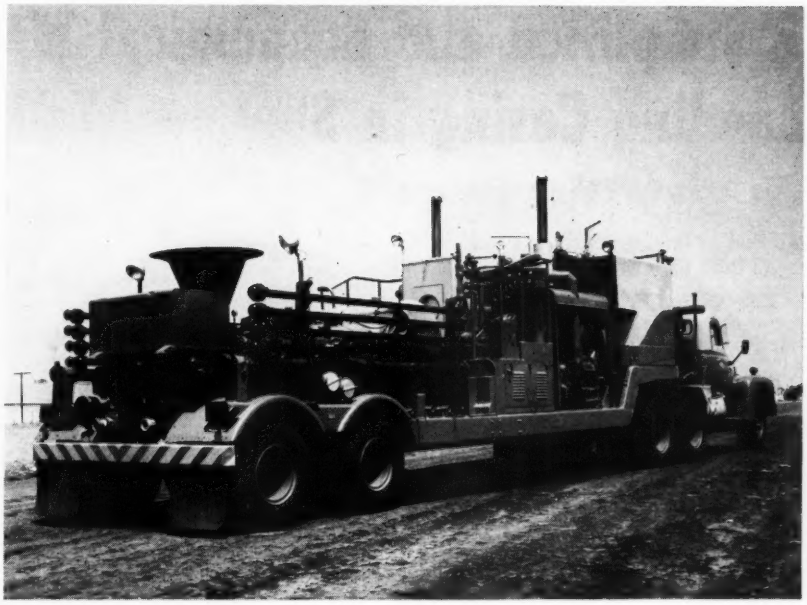
There seems to be no depth limit that would affect the efficacy of hydraulic fracturing. Hence, the controlling factor in the case of a really deep producer is just the same as in any other project, the ratio cost to return. Use of the process under discussion has been successful at depths in excess of 10,000 feet and it has been remarkably successful at shallower depths. It not only provides a means of opening new flow channels in tight formations, but where Lenticular sands are present with varied permeabilities, it can be utilized to open a way through to the more permeable sections. It can be employed to bring marginal wells up to commercially profitable yields; can even reach out behind a localized water block or mudded off area and start a flow from a formerly excluded section; and can be effectively employed to increase production of gas from a sand horizon.

There are other usages that have not been mentioned here and as study continues and experience piles up still other new applications are sure to be found. Further improvements in technique and tools are certain to come along, and the future of hydraulic fracturing seems to be pretty well assured.

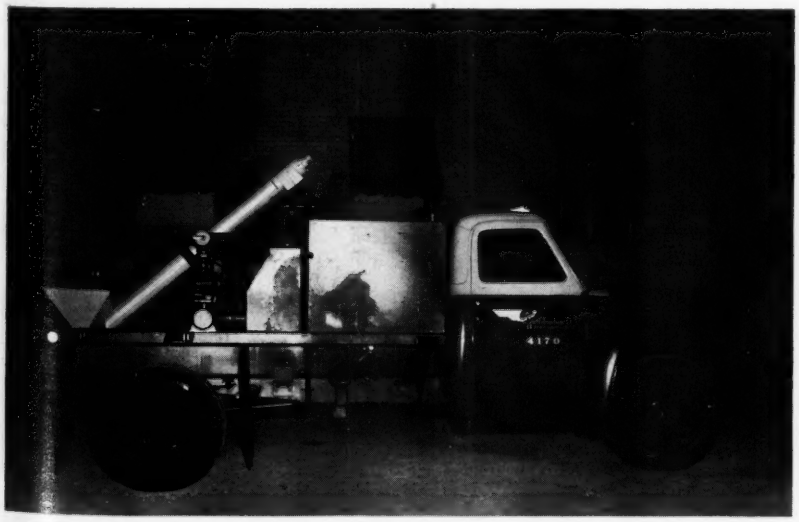
The method is based solidly in logic. In effect it merely introduces a series of horizontal or vertical gravel packs into the formation face. It is one of these rare developments that continues its result without any deleterious after effect. The fracturing fluid and the gel, if any, that gives it the required viscosity, are easily and quickly removed when the operation is over. The permeable sand that plays the part of a prop and holds the drainage channel open is the only foreign substance that remains, and that can obviously be nothing but helpful.

The layout of the equipment during the course of actual injection can be seen in the accompanying schematic drawing. The trucks carry sufficient power and pumping capacity to maintain an extremely high velocity stream until it reaches the well face, thus assuring that the sand will be kept in suspension and that the desired jacking effect will be attained. Provision is made in the hook-up for the addition of auxiliary power and pumping capacity if it should be required.

(Continued on page 33)



Twin T-10 pumping equipment, tested to 15,000 psi, powered by two 300 HP Cummins Diesel Engines.



Side view of blender that is designed to mix sand and oil or hydrafrac gel. Concentration of sand can be varied from ½ pound per gallon to 3 pounds per gallon without interruption on job.

A Simplified and Economical Method of Landing Casing in Shallow Wells

Abstract

A simplified and economical method of landing casing in shallow wells has been used by Union Oil Company for several years. The technique is basically one, whereby the conventional landing base and flanged tubing head is not used. When landing the water or oil string, cement is pumped through the tubing head as well as the casing. Slips and packing for supporting and sealing off the casing are replaced by a short column of fast setting cement.

It has been proven that the method has saved up to $975.00 per well for casing and tubing heads as well as an average of $265.00 per well in rig time saved. The method is not an entirely new idea, but it is thought that a detailed explanation of how it is handled would be welcomed by the reader.

By Scott E. Temple

Union Oil Company of California.

Surface Pipe Installation

When ordering the surface pipe, include a short joint, threaded and coupled, approximately 20 feet long for landing the casing. Should slip-joint casing be employed, have a threaded collar installed on the last joint to be run and cemented in the well.

Hole is usually drilled so that the casing may be landed with the collar on the last joint extending 3 or 4 inches above the cellar floor. Should an unusually deep cellar be in use or an allowance made for the particular riser nipple being used as a temporary base head, the last joint of casing may be landed at a height to fit conditions for proper installation of the B.O.P. equipment. When settling or caving of surface sands and gravel may be encountered, it is suggested that 3 to 5 feet excess hole be made, so the collar on the top joint may be landed at the proper place.

A minimum of 3 collars on the bottom joints and the collar on the top joint should be spot-welded.

The cement will usually set sufficiently to release and remove the landing joint within 2 to 4 hours. Use of an accelerator such as Calcium Chloride or Lumnite will assure a fairly rapid initial set of the cement. Top of the cement fill around the outside of the casing should also be checked before removal of landing joint. Should the cement be found to have dropped, be sure to fill the space with a fairly heavy slurry or cement containing an accelerator.

Installation of Temporary Base-Head

After removing the landing joint, a temporary base head or riser nipple is screwed into the top joint of the surface casing. The riser nipple which is most commonly used is 4 feet long overall. On the top is a 12" series 900 flange, with a piece of 13⅜" casing approximately 30 inches long, made up in the flange and swaged on the lower end to the size of the casing being used. A straight riser made up of the same size as the surface pipe will usually work satisfactorily, but it has been found advantageous to have the extra clearance for the tubing head when running the water string. It is also more economical to replace the short swaged section when threads become damaged. Near the bottom of the riser, a three inch collar should be welded into place and fitted with a bull plug. This is necessary so the riser and B.O.P. can be cleaned of any excess cement after running and cementing the water string. It is not uncommon to use the same riser nipple for 10 or 12 wells without needing any repairs, such as new threads. (See Plate I.)

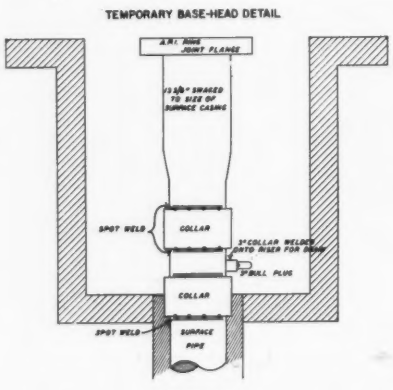


Plate I

To facilitate making up and removing the riser nipple, it is suggested that a special wrench be built and kept for use at all wells employing this type of landing technique. This wrench should have a companion flange to the one used on the riser nipple. A short piece of 13⅜" casing 2 or 3 feet long, should be made up into the flange and swaged to and installed to a 20 ft. length of heavy 4½" or 5-9/16" drill pipe. By using 3 or 4 bolts, the flanges can be bolted together so the riser can be made up or backed out by using the regular pipe tongs. The B.O.P. or spacer spools as needed may then be flanged-up to riser. It is essential that the B.O.P. is tied down securely.

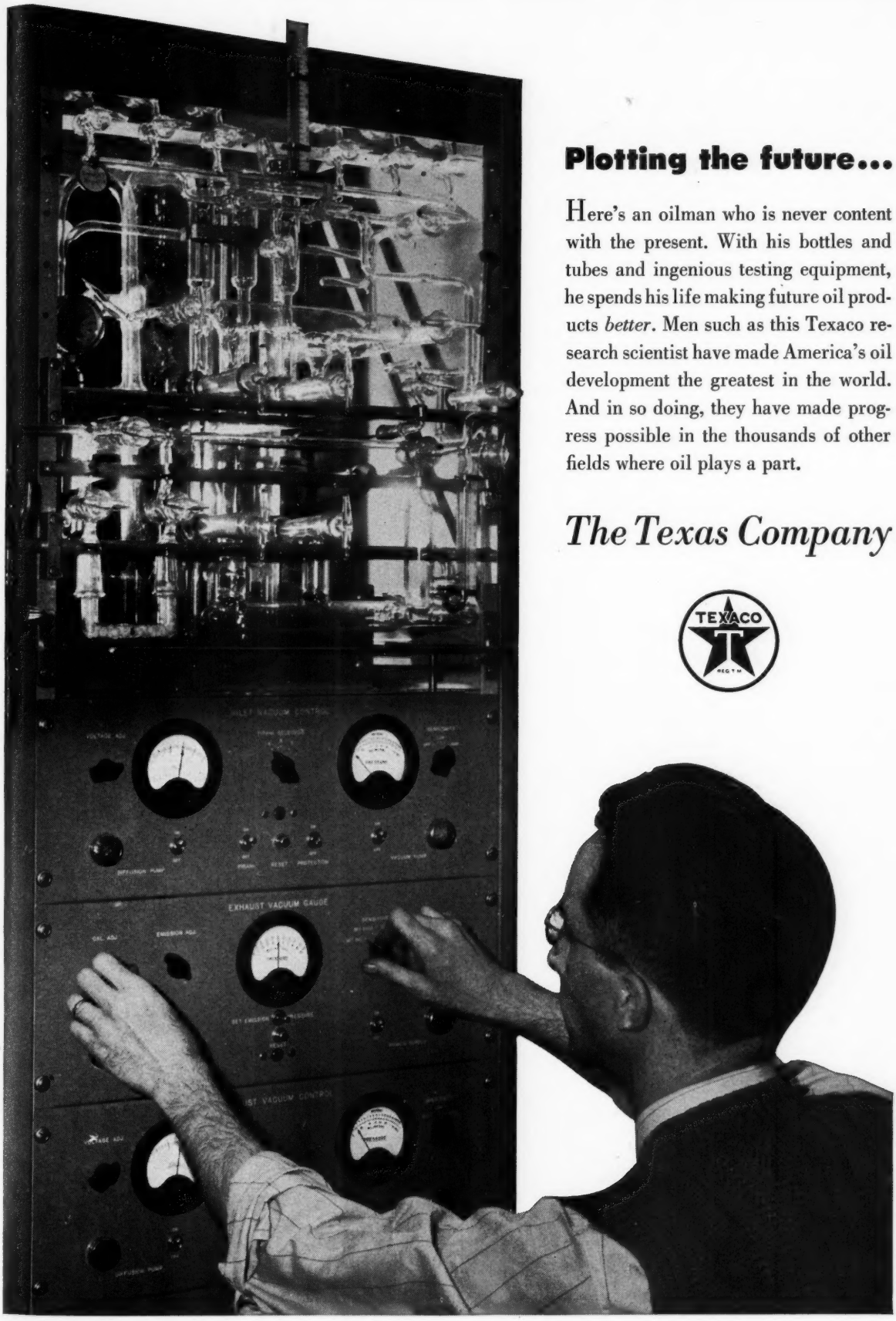
One precaution which should always be observed when installing the temporary base-head and spools to connect the B.O.P. is that it is known where the tubing head will be wanted when the water-string is run. Proper allowance must be made so the B.O.P. will be high enough above the tubing head for operation of both the rams and full-closure gate.

Landing Water String

When ordering the water or oil string, it is suggested that joints of casing measuring 5, 10 or 20 feet be included, so the tubing head can be landed at the proper height in relation to the C.P. point where little variation can be allowed.

It is advisable to spot-weld 3 to 5 collars on both the bottom and top of the water string.

A tubing head similar in construction to the National type "E" or Shaffer type "49L" will probably prove to be the most satisfactory head for this method of landing casing. The top part of the tubing head is made with 8⅝" male threads



Plotting the future...

Here's an oilman who is never content with the present. With his bottles and tubes and ingenious testing equipment, he spends his life making future oil products *better*. Men such as this Texaco research scientist have made America's oil development the greatest in the world. And in so doing, they have made progress possible in the thousands of other fields where oil plays a part.

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for the 7" head, while 10¾" threads are used on the 8⅝" head. The bottom part has female threads for making up on the casing. The heads are available, complete with hanger for either a single or multiple string of tubing. A hold-down ring for the tubing hanger is also available and recommended for use as an extra safety precaution. This ring is screwed onto the top threads of the head when completing the well. Standard 2" outlets will be found on opposite sides of the head.

The tubing head should be made up and spot-welded in place of the collar on a joint of casing, prior to sending to the well. While running the casing, flush plugs should be installed in the tubing head outlets. After making up the plugs, check the greatest diameter of tubing head to be certain plugs will not keep the head from passing through the pitcher nipple, B.O.P. and riser nipple. The welder can usually trim off any excess without lowering the strength of head or plugs.

The landing joint consists of a joint of casing, usually 15 to 20 feet long, including a swage made up and spot welded onto the landing joint. The swage is of the correct size to make up on the top of the tubing head. It is suggested that the length of the landing joint is tailored so the top is about 3 feet above the rotary table, to facilitate installation of the cementing head.

The distance from the top of the rotary table to top of the pad and bottom of the cellar must be measured prior to running pipe. When it has been determined at which height the tubing head should be landed at completion of the job, measurements are taken from the tubing head as it is run into the hole and mark made on the landing joint where to stop pipe in relation to the rotary table. If it is essential to have the outlets on the tubing head facing in a particular direction, a vertical mark on the landing joint, in line with the outlets can be made to facilitate proper alignment. (See Plate II.)

Although it is debatable whether it is necessary to work pipe while cementing, be certain to have the alignment marks in place before pipe becomes frozen too much to move.

Cementing operations are carried on in the usual manner. Following the final cement job on the water string, it will be necessary to put in a good cement job at the top of well in the annulus of the surface pipe and water string. This is used to replace the slips and packing used in the conventional landing head. There are two easy ways of cementing the annulus with excellent results. One method is to run into annulus with approximately 50 feet of ½" pipe. Pump in water until mud or cement is thoroughly displaced. Mix and pump in a heavy slurry of cement premixed with 2% Calcium chloride or 10% Lumnite. When good returns are obtained, stop cementing and remove 3" bull plug in bottom of riser nipple and clean out excess cement. Close pipe rams around casing or center casing in rotary table with blocks. Another successful method commonly employed, is to pump 25 to 50 sacks of treated cement into fill-up line, while rams are closed. Displace with enough water to clear B.O.P. and riser nipple. Hold pipe on the hook for 2 to 4 hours, depending on time for the top job to take its initial set. After backing out landing joint, operations can be carried on in the usual manner, After completion of cleaning out, testing, running and landing tubing, the B.O.P. and riser nipple are removed. Check height of cement in annulus. If it is found below the top, fill with heavy slurry. This is important, as the pipe could move slightly while pumping.

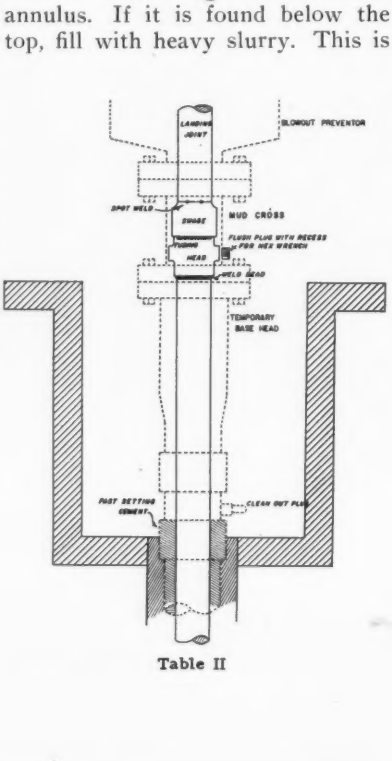


Table II

Conclusion

The method described is not especially recommended for wildcat wells where several protective strings may be needed or unknown bottom hole pressure may be drilled.

From experience to date, no trouble has been observed in wells up to 6,500 feet in depth and with less than 2,000 pounds per square inch casing pressure. It is reasonable to believe that wells up to 8,000 feet deep and having casing pressures up to 3,000 pounds per square inch could be handled satisfactorily by using this method, providing a C.P. collar is used at the upper part of the hole as a precautionary measure.

In conclusion, use of this method has proven to be: Economical, simple to use, offers complete control of well at all times, and safe, as shown by the fact that the B.O.P. is not moved until the tubing is landed and the well is ready for completion.

Acknowledgment

The author wishes to express his appreciation to Mr. K. C. Vaughan and the Union Oil Company of California for permission to prepare and publish this paper, and desires to acknowledge the assistance of Mr. V. Moyer and Mr. J. T. Ledbetter for their helpful criticism and suggestions.

(Presented at the Spring Meeting of the Pacific Coast District, Division of Production, American Petroleum Institute.)

McNeill Purchases Loscal Petroleum Co.

James M. McNeill has announced the purchase of Loscal Petroleum Company, representing 80 acres in the North Midway field with 12 wells producing from between 1000 and 1700 feet in the Tulare, Potter or Marvic zones.

Last summer McNeill bought the Rico property in the Torrance field Redondo extension, composed of 170 acres and 10 wells.

They heard footsteps in the foyer. She jumped up and whispered to her lover, "Quick! It's my husband. Jump out the window!"

He gasped: "But we're 13 stories up!"

She snapped: "This is a helluva time to get superstitious!"

Personalities IN THE NEWS

Continental Announces Executive Promotions

Promotion of three men to new positions in Continental Oil Company's western region exploration department is announced by Olen Lane, vice president and western region general manager. They are:

Lloyd L. Dodds, Los Angeles, landman, promoted to assistant regional land superintendent. He will continue to make his headquarters at Los Angeles.

Robert K. Hardesty, Olympia, Wash., landman, promoted to division land superintendent, with headquarters at Olympia.

Marc O. Miller, Los Angeles, geophysicist, promoted to geophysical supervisor. He will continue to make his headquarters at Los Angeles.

Mr. Dodds joined Conoco's production department at Los Angeles in 1945 and became a landman for the company's western region in 1949. Before joining Conoco, he was associated for nine years with another oil firm at Los Angeles.

Mr. Hardesty was associated with Travelers Insurance Company and Dun & Bradstreet in Los Angeles before joining Conoco in 1950. He transferred from Los Angeles to Olympia early this year. He received his law degree from Indiana University in 1935.

Mr. Miller joined Continental in 1948 in Texas and transferred to Los Angeles the following year. He received his bachelor's degree in geology in 1947 from the University of California.

Texas oil man Glenn McCarthy, currently looking for new oil in Bolivia, is understood about ready to announce some sort of another huge project. Two years ago, McCarthy conducted some wildcat work in San Joaquin Valley area of California.

H. F. Anderson of Richfield Oil Corporation in Los Angeles, member of the Los Angeles chapter of the Institute of Internal Auditors, was in attendance at the annual conference of the auditors held recently in Dallas, Texas.

A new Pacific Coast section of the National Association of Geology Teachers has been organized in Santa Barbara. Dr. Robert M. Norris, Santa Barbara College geology instructor, was named provisional secretary-treasurer. The new section embraces California and Nevada. Its first regular meeting will be held in Los Angeles next November.

Widely known in San Joaquin Valley petroleum circles, Frank A. Stewart, gas crew foreman for Pacific Gas & Electric Company in Kern County, has retired after 28 years of uninterrupted service. He born in Oil City, Pa., in 1889 and came to Bakersfield in 1914.

Amiable Fred Keller, Oceanic Oil Company president at Los Angeles, has completed the last detail for a well-earned vacation in Europe. His itinerary aboard calls for stops at all leading cities.

George Ring, veteran California operator, has checked out of St. Vincent's Hospital in Los Angeles, after a siege with pneumonia.

Officers of the Pacific Coast District, Division of Production, American Petroleum Institute elected at the Spring Meeting, May 6, 1954. Left to right (standing) John Van Riper of Continental Oil Company, vice chairman for Coastal Area; Lot Bowen of Western Gulf Oil Company, chairman of Advisory Committee; I. B. Doyle of Hydril Corporation, assistant treasurer. (Seated) Elsie Edmiston, of the A.P.I., secretary; C. F. Gates of General Petroleum Corporation, chairman of Pacific Coast District; Hugh C. Mays of Crescent Petroleum Company, vice chairman for San Joaquin Valley. Not shown: E. M. Benson, Jr. of Richfield Oil Corporation, vice chairman for Los Angeles Basin; Jack Lemley of Standard Oil Company of California, vice chairman for Coalinga-Kettleman Area; and Charles T. Reichert of National Supply Company, treasurer.

The appointment of Fred E. Woodring pictured above, as Executive Vice-President of the Rocky Mountain Oil & Gas Association was announced recently by W. W. "Bill" Flenniken, President of the association.

Woodring is a graduate of the University of Pennsylvania in Business Administration and took post-graduate work at LaSalle University in Chicago.

In 1936 he was employed by the Sun Oil Company as an ordinary seaman and assigned to a tanker plying between Philadelphia and Texas. His advancement with Sun Oil encompassed all phases of the oil industry until his resignation in 1948 as traffic coordinator.

In 1949 Woodring was appointed Executive Secretary of the Wyoming Trucking Association, which position he resigned to accept the RMOGA appointment. He replaces Wm. "Scotty" Jack, who resigned April 1st to become a candidate for the Governor of Wyoming.

The District office will continue to be located in Casper, Wyoming, and will serve the states of Colorado, Wyoming, Montana, Nebraska, Idaho, Utah and South Dakota.

K. W. Kendrick, Standard Oil Company of California at Los Angeles, has been elected secretary of the Jonathan Club. William F. Lyte, Douglas Oil Company, was named a director.

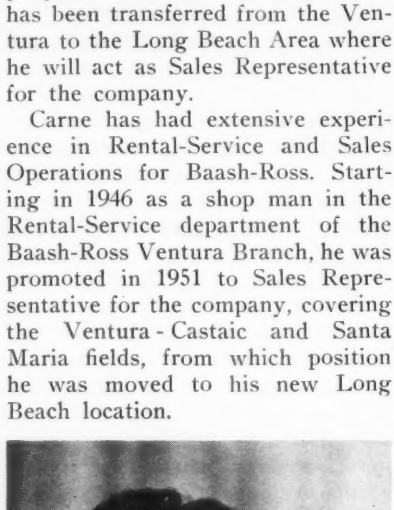
The Long Beach Petroleum Club has chosen new officers to serve for the ensuing year. Don Fowler was elected president, Paul Havens, vice president, and Gene LaForce, secretary-treasurer.

Ray Ryan, oil man and owner of the El Mirador Hotel at Palm Springs is on a three month vacation in Europe. His business interests also extend to aircraft building and uranium mines.

Baash-Ross Appoints E. W. Carne As Sales Representative in Long Beach Area

Hal Messinger, California Sales Manager for Baash-Ross Tool Company, announces that E. W. Carne has been transferred from the Ventura to the Long Beach Area where he will act as Sales Representative for the company.

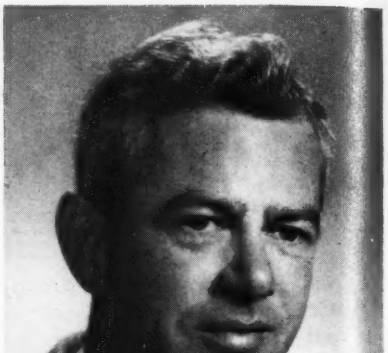
Carne has had extensive experience in Rental-Service and Sales Operations for Baash-Ross. Starting in 1946 as a shop man in the Rental-Service department of the Baash-Ross Ventura Branch, he was promoted in 1951 to Sales Representative for the company, covering the Ventura - Castaic and Santa Maria fields, from which position he was moved to his new Long Beach location.



E. W. Carne

Prior to joining Baash - Ross, Carne was employed by the Chanslor-Canfield Midway Oil Company, working in drilling and production operations in the Rincon and Fellows areas, with time out for a tour of duty with the Air Force where he served in the Caribbean and European areas during World War II.

Carne has not only been active in sales and field operations in the industry but is also active in API activities, having served on the Advisory Committee of the Pacific Coast Chapter of the American Petroleum Institute.



Edw. A Pellegrin, Executive Vice President of Macco Corporation, Paramount, California, has announced the appointment of John M. Robinson as General Sales Manager effective May 1, 1954. Mr. Robinson has been associated with Macco Corporation for the past eight years as Manager of the Drilling Fluid Division. In his new capacity, he will work in close cooperation with Mr. Pellegrin in directing the sales efforts of all Macco Divisions. Robinson attended Stanford University where he majored in petroleum engineering and worked with General Petroleum in pipeline and refinery operations during the summer months. He left the university to join the engineering department of Douglas Aircraft. Shortly afterwards he enlisted for service in the U. S. Army Eighth Air Force where he became a B-17 Pilot and Engineering Officer and after four years service was discharged as a Captain. He joined Macco Corporation on October 1, 1945, and was appointed Manager of the Drilling Fluid Division in June of 1946.

San Joaquin Valley agriculturists, whose land here and there figures prominently in petroleum development, have been prime movers in Kern County's brilliant rise in cotton yield. Harold Pomeroy, chairman of the California Cotton Planting Seed Distributors, praised Frank Jeppi, W. B. Camp, Hugh Jewett and Arthur Crites, among others, for much of the achievements attained by Kern cotton growers generally. Pomeroy spoke during special ceremonies held in Bakersfield in observance of National Cotton Week.

Highlight of the recent meeting of the Ridge Route Exchange Club at Gorman was the showing of a colored film entitled "California Natural Resources" by J. C. Haskell of Richfield Oil Corporation at Los Angeles.

With Drilling Contractors

California drilling contractors may find it of interest to know that Kerr-McGee Oil Industries of Oklahoma City was the guiding hand on contractual arrangements behind the recent oil discovery in Cuba. The well, Echevarria No. 1, drilled to a total depth of approximately 8400 feet in a sugar cane field in central Cuba, finally was completed for 30 gravity oil from a zone just below 1100 feet at a rate of more than 50 barrels a day. Two other sands around 1300 and 1650 feet have as yet had no chance to show what they could do by conventional tests. Although the lower formations were of a complexion inimicable to commercial production, countless shows of oil and gas point the way to deeper success on more favorable locations on structure. Yield from the shallow measure evidently is coming from Upper Cretaceous. Similar to Shell Oil Company discovery the other month in Nevada, the Cuban find does not merely block out a field, but a vast sedimentary basin from the middle of the island to outlying keys far south. Prior to the discovery only two dozen or more tests of consequence had been drilled in the country, with the greatest number going down along the northern coast, where oil seeps abound amidst an area of puzzling geology. Several of the leading major operating organizations of United States are engaged in extensive core drilling, geological surveys and seismograph studies in Cuba. Independents are no means out of the picture as their large concessions here and there indicate. Cubans since the discovery are eagerly envisioning new economic horizons when the country of the flourishing sugar cane will not be dependent on foreign sources for her petroleum requirements. The skill and ingenuity of American drilling contractors gained new affirmation because of Kerr-McGee's success. Grupo Jarahueca Montembo, a Cuban concern, sponsored the exploration campaign.

Stanwood I. Williams of Los Angeles, Thomas P. Pike Drilling Company president, reported that the trend toward deeper drilling is evident in the fact that six out of 14 Pike contract rigs now operating in California fields are drilling below 10,000 feet.

On the occasion of its silver anniversary the Independent Petroleum Association of America told its official publication that during the single year of 1953 this country's oil wells gave up products valued at more than $7,500,000,000. The importance of the oil well driller is attested by the relatively lower value of all other minerals combined. The IPAA estimated the annual production of coal, iron ore, gold, silver and other minerals at less than $7,000,000,000 in worth.

Krug Drilling Company is the contractor on Nev-Tah Oil & Mining Company's Artigues No. 1 wildcat well on Section 2-12s-10e, south of Los Banos in Merced County. Engineering is being handled by Pease & Fitzgerald. Nev-Tah is a Nevada Corporation with mining properties in Nevada and Utah.

Hagestad Drilling Company of Bakersfield handled the drilling chores on Reserve Oil and Gas Company's new and important discovery in the Tejon area. Known as Reserve-Pauley No. 42-34, Reserve and Edwin W. Pauley hold 640 acres in this particular play. Reserve, in addition, owns a widespread of land in the area.

Figures compiled by the American Petroleum Institute denoted that 145 new wells with an initial daily output of 27,981 barrels, three gas and three service wells were completed during March. This compared with 142 new oil, three gas and two service wells completed in February. The API also said the total production of crude oil in California for March amounted to 30,650,607 barrels or 988,729 barels a day. This was a decline of 8874 barrels daily under February, 1954.

Terry Drilling Company's interest in the Terry & Jansen partnership was reported sold to the newly-formed California Valley Oil Company, headed by James Jansen. Valley Oil also is understood to have acquired 322 acres in the Santa Paula area.

Casner & Bentz of Bakersfield has shipped a contract rig to Sanpete County, Utah, to take down a well for Brookline Oil Company in the Gunnison area.

Gene Reid Drilling Company is the contractor assigned to the development campaign sponsored by Margaret V. Kahler in the Morales field, San Luis Obispo County.

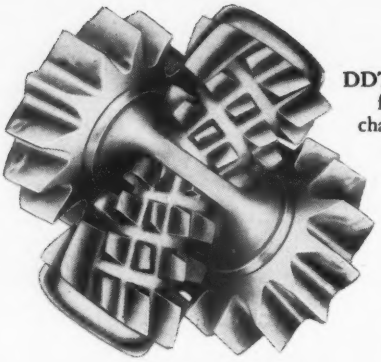
On right-of-way land leased from the Southern Pacific Railway in the Race Track Hill area, Tine Gaiser Drilling Company is preparing to drill Milton Barratt and Ernie Bysshe's SP 101-3. Barratt and Bysshe hold rights below 2000 feet on a slimmish stretch of right-of-way, which already is the scene of a number of shallow wells that were put on production last year by Prudential Oil Company.

When the husband came home drunk his wife assailed him with, "If you don't stop this drinking and carousing, I'm going to kill myself!"

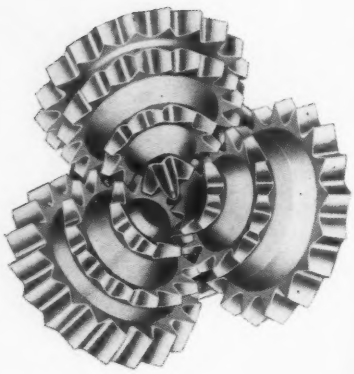
Retorted the hapless husband, "Promises! That's all I get . . . just promises!"

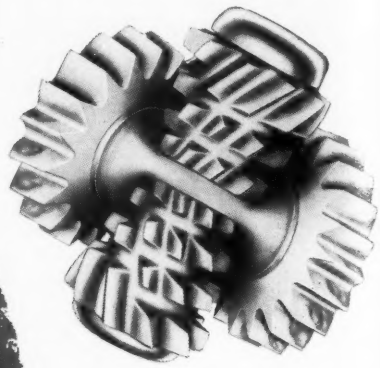
Customer: "Do you serve women in this bar?"

Bartender: "Nope — you gotta bring your own."



DDT—For long runs and greater footage in top formations—chalk, red beds, top shales and unconsolidated sands.

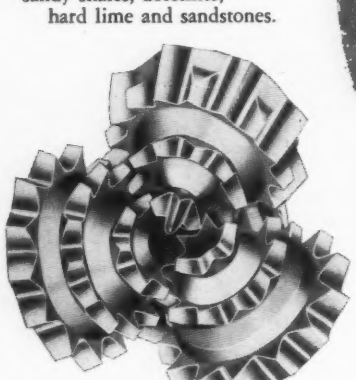


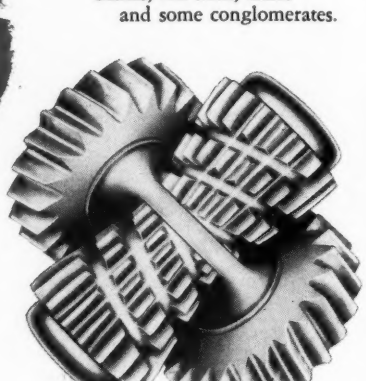


-every bit as good as the best

3C-2—For maximum action in harder, sharper formations—sandy shales, dolomite, hard lime and sandstones.

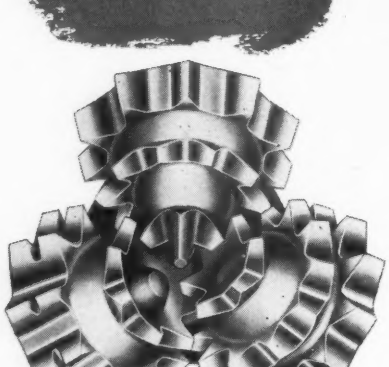
K2P—Rugged, long-tooth bit for medium to harder shales, chalks, red beds, limes and some conglomerates.





3C-K2—Designed for drilling soft to medium formations with streaks or layers of harder formations.

4—For maximum service under heavy weight in granite, chert, the harder sands and shales.

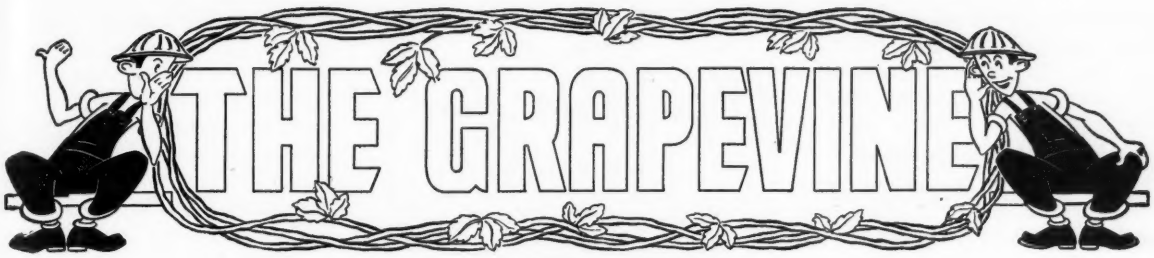


3C-DT—Fast-drilling, long-tooth bit for shales, anhydrite, chalk, medium limes and unconsolidated formations.

H C Smith
OIL TOOL CO.
GENERAL OFFICES, EXPORT OFFICE AND PLANT
COMPTON, CALIFORNIA

BRANCHES IN ALL PRINCIPAL OIL CENTERS IN THE UNITED STATES AND CANADA

CALIFORNIA BRANCHES: AVENAL • BAKERSFIELD • COMPTON • CUYAMA • NEWHALL • RIO VISTA • SANTA MARIA • VENTURA



By RICHARD SNEDDON

A Bit of Football History

About a couple of weeks ago while searching the literature for the lowdown on Norman Anderson, Richfield's No. 1 pipeliner, we were scanning the football section of our Sports Encyclopedia when we ran across an interesting bit of early day gridiron gossip, as follows: it appears that back about 1873, before the advent of intercollegiate games, Cornell University had been playing football on its own campus and one of the players had a friend at University of Michigan where the same thing was going on. A few challenges were tossed back and forth but before a game could be arranged between the two groups, it was necessary that the players obtain an official excuse from their studies. At that time a team consisted of 30 men and when representation was made to President White of Cornell to authorize the junket, he made the now classic refusal, "I will not permit 30 men to travel 100 miles merely to agitate a bag of wind."

P.P.P. Founders Honored

Henry Grinnell, Lew Bronzan, and Glenn Merkley, the three lads who conceived the PPP plan of preserving industry contact for a contact hungry group of old time oil men, were honored no end at a barbecue on Union Oil Co.'s Brea picnic ground the other Saturday, when 950 members and friends of the organization came out to thank them for giving birth to a mighty fine idea, and to wish them well in all their enterprises. By the way, before we go further may we explain that "'Lew" Bronzan is the proper mode of address. On several occasions we have been taken to task for not spelling the name "Lou" but the fact is that the Bronzan has always been a pretty good looking chap and he takes his nickname from a once great matinee idol, Lew Cody.

The Receiving Line

Returning, however, to the aforesaid barbecue, this was by all means a honey. On the receiving line were tagger-in-chief, Ed Cleveland and his gang of expert pinner-onners, including Kenny Dale and Harry Nissen, a pair of fellow Signal Oilers; the Hickey boys, Joe and Jim; Bethlehem's Jack Graves; Sandy Sarver and Norm Schrank from the Tryad Service Corporation; Jack Pyles, nephew of Bob, the Southwest Exploration Co. philanthropist; Joe Steverson of Steverson Brothers; and Kelly Thorpe, the Mills Iron Works fellow. These boys went through the entire day without a single lost time accident and, indeed, never pierced a breast—well, certainly not more than a half inch. As a matter of fact, this aggregation is rapidly becoming as much a traditional part of the PPP organization as are Hudson Drake and his potable purveyers which is really saying plenty.

The Dream Water Dispensers

In Admiral Drake's flotilla on this occasion were Roland Norris, the Young Macconian, doing double duty as entertainment chairman and dispenser of activating aquas; Dutch Lortscher, the Signal Oil & Gas purchasing chief, whose air miles add up to something that looks like a bacteria count in a well ripened cheese; Joe Bergeron, the cheerful Jet Lube chap who speaks French like a native—of Watts; Don Pinnell, the UP production whiz and domino sharpie; Rudy Schweitzer, the tall friendly chap from Southwest Exploration Co.; Chuck Ball, the front half of Black & Ball, one of the best known equipment men in the oil industry; Elmer Wycoff, the National Tube rep, known as the Jacoby of the gin rummy set; Dave Carnahan, the handsome Emsconian, scion of one of the better known oil families; Jack Freeman, the collar ad Bethlehemite and low handicap divot heaver; Bill Tetsch, the Terminal Drilling Co. smoothie, one of the ten best dressed men in the industry; Lee Laird, the Caledonian sales expert from Cardwell Manufacturing and proprietor of the best set of teeth in the equipment business; and last, the youthful Sargent Engineering sales rep, Al Pruett, a nice guy who also carves a neat divot. Altogether, about as becoming a batch of dream water dispensers as you could find anywhere.

The Chow Line

Directing the food preparation in a most effective way was Chef Otto Gillingham and with sundry other members of the 7600 dished up the finest steaks we have tasted in a long time. On the crew were such noted purveyors of the better comestibles as Cy Rubel, the saw virtuoso; Bill Butler, the Daniel Boone of Santa Maria; Kenny Vaughan, the quail hunter; Lou Kelsey, the prospective surf fisherman; Tink Tinker, erstwhile horseman of note; Harry Keegan, the secondary recovery whiz; Fred Geddes, the former Wyoming rancher; Howard Thompson, the basketball hotshot; Ed Melton, California Bears' southern cheer leader; Tom Absher, the well pulling genius; Skib Washbon, the high ranking bean cook; Jim Watson, a Bear booster from Montana; Ray Baird, a pursuer of the elusive radical; Don Mc-

Laughlin, a Webfoot appropriately engaged in water flooding; and that quiet mannered but competent engineer, Carl Bowden.

More About the Kitchen Crew

Others officiating behind the grill were Jack Anderson, a right sharp lad with a skillet; John D. Rockfellow of the Cochise Ranch in Arizona and one of the most consistent tree fellers in western golf; Ed Fitzgerald, inventor of the headache post; Mait Smith, the lad who laid out the Brea golf course; Dick Grahn, another Trojan booster, once mentioned in a popular song, "It's a Grahn old name"; Art Reas, an expert at capturing the light fractions; John Myanard, one of Bill Eggleston's understudies; Larry Bond who denies any relationship to the Treasury Bonds; Juan Pedretti, the personable Paraguayan, one of our favorite people; Floyd La Graffe, referred to secretly as "the giraffe"; Dick Goddard who, after watching Tiny Roe dispose of six steaks, remarked, "It's a good job; there is no fine for exceeding the feed limit"; Sam Paulsen, the great sandlot base runner; Ira Triggs, the lad who puts the crude oil through the wringer; and Milt Varner, the bowler, who is creeping up on 50 years with Union Oil Company, and if he makes it will have established an all time record in the company for length of service.

Pioneers Unlimited

Among the old timers who attended and had a lovely time talking over the adventures of yesterday were R. A. Broomfield, retired Barnsdall Oil Company executive; F. C. Ripley, Sr., honorary president of PPP; Frank Hill, former director of production for Union Oil Company; R. P. McLaughlin, first State oil and gas supervisor; H. H. Maddren, former Republic Petroleum Co. executive; Bill Sutherlen, retired Standard Oiler; Bill McGraw, for many years industry poet laureate; B. Reinhold, partner in the firm of Abegg & Reinhold; Clayton Severns, drilling contractor; Tom Selser, former Macco Corporation higher-up; John Augsburger, former superintendent for A. N. Macrate, now with Tryad Service Corporation; Walter Buaas, drilling contractor; Al Bailey who functions for Axelson up Taft way; Bill Clark who helped bring in the Lakeview gusher; Bill Thorn, Technical Service Company; Julius Dietzel, Baash-Ross Tool Company; M. R. Rosenlieb, Ohio Oil Company; George Kammerer, old time Union Oiler; R. E. "Ed" Stearns, Universal Consolidated Oil Co.; K. L. Kellogg, national president of the AAODC; Tom Hickey, a Coalinga boy who made good in his own supply business; George M. Brown, Illinois Crude Company, W. M. "Brownie" Brown, retired Standard Oiler; Stanley Minor, the Regan Brothers, engineering whiz; N. J. Norris, former Bell & Loffland executive, also famed as the father of Roland; Dick Smith of National Supply Co.; Dick Guiberson, W. R. Guiberson Corporation;; Elmer Bolton of Ohio Oil Co.; Walter Thompson, the contract driller, and so on indefinitely.

Divers Contributors

There are a lot of other people who should be mentioned as having played a part in making this barbecue a success, for instance, Mitch Dion, who did a neat job of looking after the parking; Floyd Vaughan and Tiny Roe of Halliburton, Bill Clauson of Pike Drilling and Verdi Boyer, UCLA all American, from Sargent Engineering, who directed the crews of volunteer waiters; Ken Faulkner who never fails in some substantial way to contribute worthwhile help and advice; Don Petersen, the Flying Horseman, who pitched in and really made himself useful; Joe Siegel, the Tryad Service Corporation head man, who was busier than the proverbial bird dog signing up new members. And, of course, leave us not forget President Duke Follansbee who kept a weather eye on the whole proceedings and appeared to be thoroughly enjoying the process.

PPP Becomes International

By the way, we just had a letter the other day from Charlie Reichert over in London, England, in which he tells us that a chapter of PPP is about to be started over there. Besides being given the Reichert

The Lufkin Line

By VIC FAWCETT

PEDDLERS' PARADISE

It is hard to find words which will fully describe the fine hospitality of Union Oil's Southern Division Production staff on the occasion of the Salesmen's barbecue May 20th at Stearns Park, Brea.

Tal Ledbetter and his talented steak fryers tickled the tonsils and pleased the palates of the pig iron peddlers from every corner of the derrick orchard.

Duncan Hines may know and understand good eating, but get a gang of barbecue experts together like Lou Kelsey, Pinkey Tinker, Al Fowks and Otto Gillingham, not to mention Carl Bowden, Jack Anderson, Dick Grahn, and Jim Watson —together with authorities like Art Reas, Sam Paulsen, Fitz Fitzgerald and Harry Keegan—why Duncan may as well throw the book away and start over.

To be an eating participant at this annual affair where good food and good fellowship prevail is truly one of the most enjoyable events we salesmen are privileged to attend.

(Lufkin produces the finest . . . Pumping Units . . . Gear Reducers . . . 2 Cycle Gas Engines.)

impetus, this movement is being spark-plugged by E. C. "Ted" Masterson, manager of the oil department of Kuwait Oil Company, Ltd., who has spent many years in drilling and production over here in Oklahoma as well as in Roumania, Egypt, and the Middle East. Hope we can go over there and help with the organization. Charlie is hoping to be back in his old haunts in another two or three months and we shall be interested to learn how much his Torrance accent has been affected by contact with the Oxford dons and the Picadilly johnnies.

News of the Pipe Liners

Jack Pate, Union's southern division pipe line chief, tells us that Jim Robertson is now assistant district pipe line foreman at Ventura. Jim was a licensed ship's master but skipped from marine to pipelining in 1948 and is now doing very nicely as a land lubber. Jack Spaulding, a refugee from the refinery, is now holding down the office engineer's job at Santa Fe Springs. Jack is an engineering graduate from California State Poly at San Luis Obispo and is well qualified both by education and experience for his new assignment. Another former refinery employee now giving his time to pipe lining is Bill Shumate, the personnel and safety supervisor, who was recently transferred to the southern division pipe line department. Bill is a chap with a raft of experience in the field of safety and fire prevention which is a mighty important part of any kind of operation nowadays.

Hither and Yon

Another colorful card recently from John Abrams, the artistic one, showing a kilted Scot in a most embarrassing position because of the proximity of some very "jaggy" thistles. All of this accompanied his announcement that he was going to Montana and hence would be unable to attend the PPP fracas at Brea. In the same mail a note from G. Raysor Brown, West American Rubber Company, to say that he is retiring to his bird ranch at Arcadia after almost 40 years of ardent effort. We would suggest that he and Johnny Quayle, the ex-Union Oiler get together. Johnny lives out Arcadia way too, is a pigeon fancier, and is pretty swell people. Bill Loomis, The Texas Company old timer down at Long Beach, returned from Seaside Hospital a short time ago, after a series of treatments, including blood transfusions, and says he is now "rarin' to go." However, the doc and Mrs. Loomis don't think he is quite ready for the strenuous existence yet, but at least are going to permit him to have a limited number of callers. If you are a friend of Bill's and would like to have a chat with him, please first phone Mrs. Loomis at L.B. 628574 to make sure that the occasion is right. Bill will be more than glad to see you.

THE PATTERSON SAGA

The subject of the accompanying illustration is Sam Patterson, a personable and altogether pleasant chap, who functions very effectively as assistant to the president of Bankline Oil Company, and engages in a number of additional enterprises some of which are not entirely, or perhaps we should say, not consistently profitable. Sam was born in Cleveland, Ohio, but before he had quite taken root, he was whisked to West Virginia. There he remained until at the age of ten he was able to persuade his parents that California was the place to live. They came to Los Angeles where Sam has done a very fine job of ingratiating himself with the petrolic people. In 1939 he graduated in petroleum engineering from University of Southern California and immediately thereafter attached himself to Bankline Oil Company as a roustabout. He was occupied with the usual assortment of field operations for a time, becoming thoroughly familiar meantime with the technique and lingo of the trade. In subsequent years through a succession of elevations he established himself as a capable administrator and was finally lofted to his present position. Sam is a youngish chap with an ingratiating smile and a fine personality. His favorite extra-curricular activity is golf which, as a member of that exclusive body, the Nineteeners, he enjoys frequent opportunities to indulge. He plays the game well and his membership would perhaps be rather a lucrative adventure if it weren't for the fact that he allows himself to be lured into occasional jousts of gin rummy. He also plays dominoes and in this less destructive pastime is regarded as somewhat of a sharpie. Over the years he has been active in API, AIME, and other industry associations, and he is a popular member of the Los Angeles Petroleum Club. The Patterson family consists of two girls and one boy, and we can confidently recommend the head of the household as one of our better people.

D & D Election

Hot off the teletype are the results of the Los Angeles D and D Club election and we are pleased beyond measure to find that we now have a host of good friends in high places. Named president is none other than Kay Livada, the lovely secretary of Glenn Camblin, the Tret-O-Lite executive; first vice president is Lucille Lyle, another lovely lady with whom we have from time to time had business exchanges; second vice president is Helen Hogan who keeps Ed Stroud's calendar in good order over at Signal Oil & Gas; recording secretary is Faye M. Jordan, Bob Eiche's amanuensis; corresponding secretary is Louise Schock, Ed Masters' secretary at Shell; and the two new directors are Margaret Martin, Baker Oil Tools Inc. cashier, and Betty Meagher who keeps Pete McArthur's affairs straight down at Fluor Corporation. All we have to say is "congratulations" and we couldn't have picked a better slate if we had done it ourself. Incidentally, we hear that Alba Gleason has had several offers from the TV studios following her outstanding performance at the dinner on election night.

A World Traveler Returns

Just back from a globe circling tour is Frank Gess, the Santa Fe Drilling veep. During his trip Frank inspected Company operations in scattered

600-barrel UOP Platforming unit installed at R. J. refinery near Princeton, Ind.

PLATFORMING CHANGES MARKETING METHODS OF R. J. OIL & REFINING CO.

By Henry P. Smith, President
R. J. Oil & Refining Company, Inc.

HIGH quality products being produced in our new UOP Platforming unit have given R. J. new stature in its marketing area and have brought about sweeping changes in marketing techniques.

Henry P. Smith

Before the Platforming unit went on stream at our refinery near Princeton, Ind., R. J. sold premium and regular gasolines at prices lower than those posted at the wholesale outlets of other oil companies.

Now, because R. J.'s gasolines have the highest octane ratings of any in our marketing area, we are commanding prices on a par with those of other companies. And a new theme song—"Fill 'er up and feel the difference"—is being chanted by motorists patronizing our stations.

Motorists are enthusiastic in their praise of the new "Platolene" premium gasoline and "500" regular—both products of the UOP Platformer.

Gasoline sales have nearly trebled since September 5, 1953, when the Platforming unit went on stream. A credit card system was established recently, and already 200 motorists in the 100-mile area R. J. serves have availed themselves of this service.

First Standard "A" Unit

The process design for the Platforming unit was handled by Universal Oil Products Company engineers. All of the mechanical design and drafting, purchasing, and construction were handled by Procon Incorporated. The unit is the first "package" installation of a Standard "A" UOP Platforming process unit.

The decision to install the Platforming unit was made after careful investigation convinced R. J.'s management that it was the ideal catalytic reforming process which would enable the company to become a leader in a marketing area where the race for higher octanes was constantly increasing.

Other factors which motivated our decision were:

—We felt that Platforming would give R. J. a more marketable product.

—We were convinced R. J. could abandon its below-market price policy because of high quality products without suffering a loss in sales.

—We believed that a Platforming unit would give the refinery sufficient flexibility so that the company could always stay on top in the octane race.

—UOP's long record of giving service to licensees.

R. J.'s Platforming unit is equipped with a desulphurizer. Raw charge consists of 400° F. straight run gasoline which goes from storage to a heater, the desulphurizer and then to a prefractionating column.

A cut of approximately 270° F. end point is removed overhead from the prefractionator. The reactor charge, taken as a sidecut from the prefractionating column, is of 400° F. end point material. The sidecut goes from the reactor charge pump through three heaters and reactors.

Recycle Gas Through Reactor

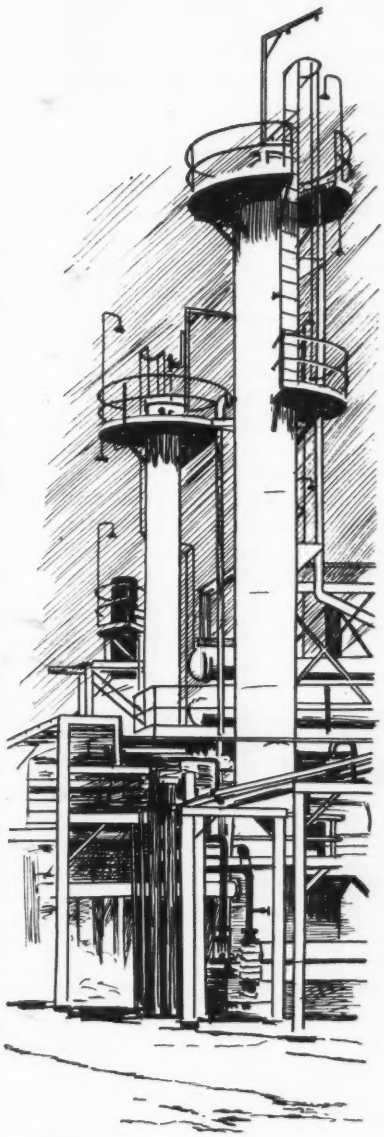
After passing through the No. 3 reactor, the material is sent to a products separator. The compressor takes suction from the top of the separator and recycles the gas through the reactor section.

The liquid bottoms product from the separator is charged to the stabilizer together with overhead material from the prefractionator. Stabilizer effluent is pumped to storage as marketable products.

Sulphur content of the charge stock is converted in the desulphurizer into H_2S, which in turn is removed from the prefractionator in a net overhead cut. The H_2S is removed overhead when this cut is charged to the stabilizer. Gas from the stabilizer is sent to a gas balance drum before being injected into the refinery fuel gas system.

R. J. has spent nearly $1,000,000 to bring to its motoring public the finest gasoline that can be produced. Because of the increasing demand for our gasoline and other products, we are contemplating an extensive expansion program. Present plans call for doubling the size of the Platforming unit from its present 600 B/SD capacity. It is hoped that this expansion program will be completed by late 1954 or early 1955.

It is our firm belief that Platforming has made R. J. an increasingly important factor in the economic life of southwestern Indiana, and that the company will continue to grow and prosper because of the superior quality of its products made possible by Platforming.



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parts of the world. He visited Peru, Chile, Montevideo, Buenos Aires, Rio de Janeiro, Venezuela, and then traipsed across the Atlantic to Lisbon, Madrid, Rome, Sicily, (where he checked in on Gulf Oil Company operations). Thence he dropped in at Tunisia, Kuwait, Saudi Arabia, Kurachi, Rangoon, and Singapore, at which latter he consulted with officers of Socony and Shell companies. Next he journeyed to Sumatra and Java, calling at the headquarters of Cal-Tex, after which he headed for Australia, had a good look around there, and finally landed in Honolulu where he met Mrs. Gess and enjoyed a week's vacation before returning home. Santa Fe Drilling Company now has 20 rigs in foreign service which ought to be some sort of a record for a western drilling company.

Edw. A. Pellegrin, Executive Vice President of Macco Corporation, Paramount, California, has announced the appointment of James D. Hawkins as Manager of the Drilling Fluid Division to succeed John M. Robinson, who has been advanced to General Sales Manager. Hawkins attended the University of Southern California and the University of California, Los Angeles. He is well known for his work in the field department of the Union Oil Company for sixteen years in several capacities as well as his more recent Macco activities. Hawkins became affiliated with Macco in 1948 in the Drilling Fluid Division and was appointed Sales Manager in 1951. Both Hawkins and Robinson new appointments were effective May 1, 1954.

Calada Materials Co. announces the appointment of Don E. Gray, pictured above, as its sales representative for the Ventura territory. Gray recently returned from the Near East where he trained Iranian nationals as mud engineers for Drilling and Exploration. Previously, he held executive positions with Macco Corp. in the Rocky Mountains and the Mojave Corp. in California.

Mud engineer Kenny Wentworth transfers from Long Beach to the new Ventura office. Calada will stock a complete line of mud materials at both Ventura and Santa Paula.

W. R. Sidenhafen, president of Suburban Gas Service, Inc., with main offices in Upland, California, was elected president of the Liquefied Petroleum Gas Association at the organization's annual convention in Chicago. Members of the association are engaged in the distribution and sale of liquefied petroleum gas—propane and butane—for domestic, commercial and industrial uses over the United States. Suburban Gas Service was formed in 1948 and operates in some 18 communities throughout Southern California and Arizona, serving more than 15,000 customers.

George C. Sheahan, Oregon oil marketer, has been appointed a director and vice president of Sunset Oil Company of Los Angeles. He also has been selected as executive vice president and general manager of United Petroleum Corporation with main offices in Portland. United Petroleum was recently acquired by Sunset.

Arizona Wildcat Drilling Deeper

Drilling is being continued 1000 feet below grass roots with the wildcat on the Winslow Anticline, 19 miles southeast of Winslow in Navajo County, Arizona. It is sponsored by J. A. Eisele, Beverly Hills, Hugh Rapp, Los Angeles; and J. A. Cronin, Casper, Wyoming. The block is made up mostly of Federal leases adjacent on the north by Navajo Indian lands.

At Boundary Buttes, in New Mexico, Arizona and Utah, Ohio Oil Company is all set to drill an interesting project. Natural gas yield has been proved in the New Mexico and Arizona corners, and Ohio's new task is bent on duplicating events in the adjoining states with a 7000-foot exploratory hole in southeastern Utah. Ohio's wildcat, Navajo No. 1 in Section 10-43s-21e, is in San Juan County and five miles from Shell Oil's Navajo No. 1, which found several million cubic feet of gas and was hailed as Arizona's first well.

Union Oil to Construct Addition to Refinery

Union Oil Company announced recently it will construct a $100,000 450-barrel per stream day Unifining unit at its Cut Bank, Montana, refinery. This unit is Union Oil Company's fixed bed cobalt molybdate catalyst unit designed to desulfurize feed stocks in the presence of hydrogen gas.

The Unifiner will utilize excess hydrogen gas produced by the catalytic reforming unit being built by the Ralph M. Parson's Company to improve the quality of gasoline blending stocks.

While the Unifiner is not needed to pre-treat the gasoline blending stocks for the catalytic reformer, it has proven attractive to utilize the excess hydrogen produced by the reformer, thereby making it possible to improve the quality of stove oil and diesel oil products of the refinery.

The Unifining process is currently being licensed to the industry by Union Oil Company and the Universal Oil Products Company.

Record Attendance at San Joaquin Barbecue

A record-breaking throng of oil men traveled to Bakersfield recently to enjoy the American Petroleum Institute's fifth annual barbecue and golf tournament. Sponsored by the San Joaquin Valley Chapter of the A.P.I., the annual event has in the space of five years earned widespread recognition as one of the biggest and most successful of western oil men's get-togethers.

An estimated 700 oil men took in the barbecue, which was held at Bakersfield Country Club, and a record field of 372 played in the golf tournament. Fifty of the golf players had to be rerouted to the Stockdale Golf & Country Club after the Bakersfield Country Club course was taxed to capacity. Entrants came not only from every oil-producing sector in California but also from as far away as Sumatra.

Chairman of the barbecue was R. R. Robison of Shell Oil Co., with H. M. Van Clief of Honolulu Oil Corp. serving as assistant general chairman. Other committee heads were Frank Hoover of Hoover Drilling Co., chairman of the golf tournament; Bob Wilfert of Richfield Oil Corp., prizes; Vic Guidera of Tide Water Associated Oil Co., food; and Frances Barker of Union Oil Co. of California, finances.

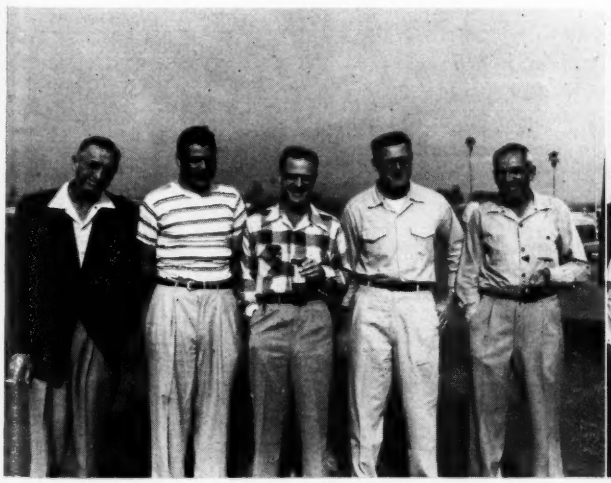
Succulent barbecued beef was prepared by Don Donley of Axelson Manufacturing Co., assisted by George Howells of Tide Water Associated Oil Co.; Wes Arrington of Lee Boyd Construction; John Sharp of Sperling Co.; Russ Hanks of Tide Water; A. E. Coltrin of General Petroleum Corp.; L. H. Carroll of G. P.; George Howells, Jr., and Jerry Free.

Festivities began bright and early —at 5:30 a.m., to be exact, when the first foursome teed off at Bakersfield Country Club. Other foursomes teed off with clock-like precision at seven-minute intervals until the last foursome moved out nine hours later.

Bob Crozier and Frank Hoover tied for top honors in the golf tournament with a low gross of 74. Ed Richardson finished next with a 75. Other low gross winners were Leon McDonough, Red Radke, Jack

l to r: Bob Richards, Pacific Western Oil Corp.; Dick Ganong, Barratt & Bysshe; John Petrovich, Lane-Wells; Phil Craner, Standard Oil Co.; John Ray, Conservation Committee.

l to r: Willard Collier, Lee Boyd Construction; Tiny Chancellor, Fat Dunlap; John James, Shaffer Tool; Dan Nowlan, Continental Oil Co.; Otis Cullum, Cullum Welding.



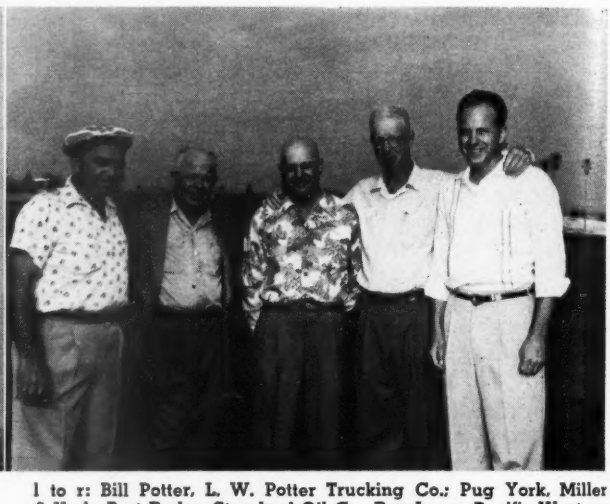
l to r: Whitey Rowland; Oil Well Service; Jim Wylie, Western Gulf Oil Co.; Lum Lovely, Union Oil Co.; Wayne Houston, Schlumberger; Mac Stewart, Palomar Oil & Refining.

l to r: Floyd G. Past, Floyd G. Past Co.; Andy Foraker, Humble Oil & Refining Co.; Barney Barnard, Richfield Oil Corp.; Pat Wright, Superior Oil Co.; Irv Schwade, Richfield.

Smith, Howard Knost, Sam Watson, John Speirs, Jim Gedds, Art Tognini and C. A. Kerfoot. O. N. Andrews was top man in the low net class with a 63. Other winners were E. H. Lumpkin, Paul Carpenter, Bud Williams, Jim Rennels, Glen Woodward, Louis Regan, R. E. Burbeck, John Huggins and Ralph Rouse. Low blind bogey winner was Jack Beach with a net of 30. Other winners were W. K. Felnagle and J. Bogust.

Assisting Chairman Frank Hoover with the golf tournament were John Fraser of Union Oil Co. of California, Cliff Reese of J.D.R. Oil Co., Roger Brown of Bethlehem Supply Co., Milt Dreblow of Brown Drilling Co., Les Bible, John Huggins of Western Gulf Oil Co., Frank Burt of G.P., Bill Comstock, Tom Fitzgerald, Tex Rickard of Intex Oil Co., Jack Beach of Oceanic Oil Co., Tom Cullen of T. J. Cullen & Son, and Tom McElheny of BJ Service, Inc.

l to r: Bob Wilfert, Richfield Oil Corp.; Ralph Fanthus, Kobe; Carl Frazer, Lufkin; T. S. Melby, Shell Oil Co.; C. G. Carlson, Union Oil Co.



l to r: Bill Potter, L. W. Potter Trucking Co.; Pug York, Miller & York; Bert Ryder, Standard Oil Co., Ray Jones, Pacific Western Oil Corp.; Paul Huggins, Western Gulf Oil Co.

McCullough Announces Personnel Advancements

I. J. McCullough, President of the McCullough Tool Company, announces eight promotions in the Mountain Division of the company and the opening of two new service branches in Wyoming.

Elmer Moody, formerly service manager of the Williston, North Dakota branch, has been appointed General Manager of Operations in the Mountain Division. Mr. Moody will make his headquarters at Casper, Wyoming, where he will supervise all operations of the various McCullough branches throughout the Rocky Mountain area. Moody is a veteran of 12 years service with the company.

Glen Horrie, formerly sales engineer at the McCullough Bakersfield, California branch, has been appointed Sales Manager for the Mountain Division and will be directly in charge of all sales engineers in the Mountain Division. Mr Horrie is a Navy Flier and graduate of the University of Southern California. He has been with the company for over 5 years.

W. A. McCullough has been appointed Division Manager of Logging Operations in the Mountain Division. He will remain in Casper and will direct all logging activities of the company in that area. He has been with the company since 1940 with time out for 5 years service with the Navy during World War II.

Harry Whittaker has been appointed Service Manager of the Williston, North Dakota branch, replacing Elmer Moody, the new Mountain Division General Manager.

The two new service branches are located at Newcastle and Cody—both in Wyoming.

William Newashe has been appointed Service Manager at Cody. William Shields has been appointed Service Manager at Newcastle. James E. Wren will take over the duties of sales engineer at the Newcastle branch.

Loren L. Ashley has been appointed sales engineer at the Sterling, Colorado branch.

C. R. Hurst will remain at Casper as Service Manager. Harmon Burns will remain at the Sterling, Colorado branch and Charles Bilbey at the Vernal Utah branch in their present positions as Service Managers.

Vearl J. Sanders, sales engineer, has been transferred from the McCullough Williston, North Dakota branch to the Bakersfield, California branch.

"Reorganization of the Mountain Division's Sales and Service Departments will assure closer coordination and improved service in an area where time and distance are critical factors," states Mr. I. J. McCullough.

Linda Gloeckler, Superior Oil Company, has been elected president of the Desk and Derrick Club of Bakersfield. She succeeded Evelyn Fox of Union Oil Company. Arlis Wessel, Oceanic Oil Company, has been named first vice president; Monteen Kerker, Halliburton Oil Well Cementing Company, second vice president; Gertrude Radeker, Union Oil Company, treasurer; Jerrie Wood, Schlumberger Well Surveying Corporation, recording secretary; and Katherine Rister, The Texas Company, corresponding secretary. New directors elected are Barbara White, Standard Oil Company; and Betty Warnock, Buaas Drilling Company.

International Geophysics Equip for Offshore Seismic Work

Latest to equip for off-shore seismic work along the California coast is International Geophysics, Inc., of Los Angeles, according to an announcement just released by Dr. J. J. Jakosky, president. This firm recently purchased, and fitted with the most modern instrumentation available, a fleet of appropriate craft consisting of a 55 ft. cabin cruiser for survey and utility work, a 63 ft. ship for the seismic recording equipment, a 45 ft. cruiser which functions as the shooting vessel, and two 35 ft. cruisers for general utility work.

In addition to the essential seismic apparatus, all vessels carry special radios for geophysical work, have the conventional ship-to-ship and ship-to-shore radio, and the latest design depth finding and direction finding instruments.

A complete novelty is the inclusion, for the first time, in an offshore seismic set-up of a broad band camera. This device and the technique of its operation, perfected over the past six years by I.G.I., permits playback of the original record and repetitive study to determine the most pertinent filtering and mixing combinations. The playback feature is especially helpful where reflections are weak or are confused by extraneous influences, such as wind, noise, or wave action on the beach.

The International fleet is now at La Jolla, where in cooperation with Scripps Institution of Oceanography and under the observation of the State Lands Departments and the Fish & Game Department, a comprehensive study is being made of the effects of various types of explosives and various shooting patterns on fish and other marine life in underwater shooting areas. The experiments will also determine ideal shooting conditions for the most effective seismic results.

This research will be concluded within another thirty days, and the fleet will then begin off-shore prospecting. The seismic investigations are under the immediate direction of John J. Jakosky, Jr., of International Geophysics, and the biological phases of the study are under the direction of Dr. Carl Hubbs and Andreas Recknetzer of Scripps Institution of Oceanography.

Petroleum Chapter Field Trip Covers East L. A. Basin

Nearly 200 members of the Pacific Petroleum Chapter, A.I.M.E., took a field trip Saturday, May 1, which covered points of outstanding oil interest in the Brea-La Habra area. The tour included an open house and luncheon served by Chiksan at its Brea plant, and a barbecue at Union's residential production operation at Sansinena, the laboratory facilities of the California Research Co. at La Habra, and Standard's water injection facilities on the Murphy-Coyote lease.

Standard Gives Two Scholarships

Standard of California has announced presentation of two $400 scholarship awards each to the University of San Francisco and San Francisco State College. They will be given to deserving students on a competitive basis by the two institutions for the 1954-1955 school year.

The Easiest and Quickest Powered Swivel to Use

THE BOWEN POWERED SWIVEL

Complete trailer mounting provides ease of getting the Swivel to the job. The use of self-sealing couplings insures ease of setting up Swivel. Direction of rotation, speed and torque are easily controlled by the operator from the control box. Swiveling hose connection eliminates any possibility of contaminating the Swivel because it is a separate, easily installed unit located below the rotating unit.

Eliminates Fire Hazard

Locating the trailer-mounted prime mover unit, which is equipped with spark-proof ignition and exhaust, at a safe distance from the well prevents all danger of fire hazard.

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are used for all types of light and medium rotary operations because they eliminate the necessity of moving in Kellys, rotary tables or other heavy equipment for light or medium short-time rotary work and because they eliminate the inefficiency and even danger of rotating strings by hand. Bowen Powered Swivels are sensitive enough for small torque operations like cutting with macaroni or sucker rods, yet sufficiently rugged to do clean-out and milling jobs. They are available in two types for light-duty operations and medium-duty rotary work.

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SOUTH MOUNTAIN

NOW ONE OF THE TOP FOUR IN "COASTAL REGIONS" PRODUCING FIELDS.

South Mountain is the highest producing oilfield above sea level in the State of California. In the space of two miles it rises 2,300 feet. From its summit you can see Santa Barbara Island 45 miles west and Catalina Island 100 miles to the South. It is described as the "most scenic of all California oilfields because of its rugged contours." Its wells are poised on the ridges and cling to slopes so precipitous that personnel rosters are screened to find crews with no fear of high places.

California's most picturesque oil-producing area soars 2,300 feet above sea level two miles east of Santa Paula. Picture gives an idea of the rugged, precipitous terrain. Discovery well was completed 38 years ago, and there are now over 300 wells in operation. In the picture just above the tanks, which dot the steep slopes, are two of the many American-National Treaters that help service over 61.5% of the oil produced from beneath this fabulous mountain.

1953 OUTPUT OVER 62% ABOVE 1952

. . . FIFTY-EIGHT NEW WELLS WERE BROUGHT IN DURING 1953 . . .

The outstanding success of this field is a tribute to the perseverance and skill of the producing companies in mastering unprecedented obstacles and hazards, and also to their judgement in the selection of equipment. ***Wells producing 61.5% of the oil on South Mountain are serviced by the American - National ICP and XCP Treaters supplied by the Oilfield Division of the AMERICAN PIPE & STEEL CORPORATION of Alhambra, California.***

SPECIALISTS IN CALIFORNIA OILFIELDS

The engineers and field service men of the Oilfield Division of AMERICAN PIPE & STEEL CORPORATION confine their activities exclusively to California. This intensive concentration over many years ensures thorough familiarity with the needs and problems faced by California oil producers. This is why we are able to cooperate so effectively with our customers in recommending the right equipment to use for each well head operation.

American-National ICP Treaters on south slope of mountain. Each treater handles the output of ten or more wells at a substantial saving in gas and oil and increased gravity. Proof of these savings is given in this typical testimonial:

"$133.00 per month saving on gas;
$486.00 worth of oil saved each month;
$112.64 per month for increased gravity.
$731.64 Total saving each month."

A COMPLETE LINE

The AMERICAN-NATIONAL line of products not only fills every present production need but is constantly being augmented with new and advanced designs by the world's foremost petroleum equipment engineers.

Absorbers • Adsorbers • Chemical Pumps • Dehydration Units, Gas • De-Sulphurization Units, Gas • Distillate Recovery Plant Equipment • Fluid Boosters • Heaters • Low Temperature Extraction Units (LTX.) • Salt Water Disposal Equipment and Systems • Scrubbers • Separators • Tanks • Treaters • Vacuum Traps • Vessels • Water Knockouts

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Field Development

Water Flooding Operations Grow

Widening interest in water flooding as a means of washing out additional oil from sands already much used in primary operations is certified by plans of Continental Oil Company to engage in such work in the San Miguelito field in Ventura County. Proximity of the field to the ocean will permit Conoco to chalk up a new first by using water direct from the sea. It has been estimated that the company is likely to gain a profit of some $25,000,000 from this secondary work over and above what otherwise would have been accomplished in the way of income by customary development. Three Grubb oil sand zones in the field are now giving the company a combined 6000 barrels of oil a day. In the Dominguez field of Los Angeles County, an operating integrant, made up of Union Oil, Shell Oil and Dominguez Oilfields, is giving the concluding and deft touches to water flooding projects in one part of the area after completion of pilot operations. Just now in the San Miguelito field, Conoco is taking down three wells. The company's properties extend to 21 states and as of April 15 last these holdings were the scene of a half-hundred busy drilling rigs, of which 36 were taking down development wells and 13 sinking exploratory projects.

Deep Zone Oxnard Project Completed

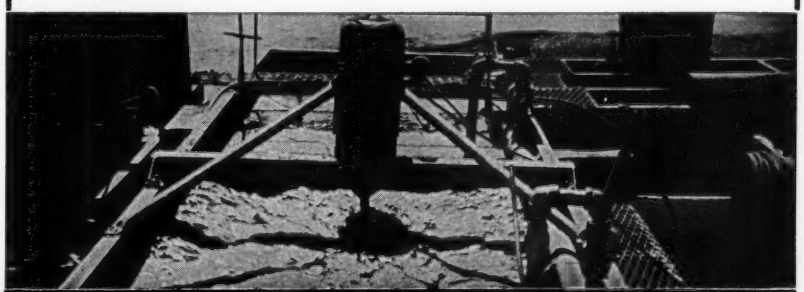
Nothing foreseeable will disturb the orderly and important development of the deeper formations at Oxnard in Ventura County, although Standard's lastest completion, Lucas No. 1, is pumping only 50 barrels of 34.2 gravity oil a day from 9033 feet. The well was taken first to 10,570 feet and then redrilled. Previous wells, brought in from the lower zones during the past year or more, were disposed to do better. The next deep completions due at Oxnard are Standard's McInnes No. 2 and Lloyd Corporation, Inc., Borchard No. 1. The Lucas pumper is on Section 1-1n-22w and the McInnes and Borchard jobs on Section 31-2n-21w. There is some talk in the field that Standard is paving the way for acquisition of the old Vaca lease, which Intex Oil Company holds under a deal with The Texas Company.

Sespe Wildcat Drilling Ahead

An objective depth of approximately 2500 feet is the goal of Western Empire Petroleum Company's Church No. 1 wildcat well on Section 33-5n-19w in the Sespe area, Ventura County. Company officials, in discussing the test, pointed out that the project is no great distance from two shallow wells taken down on the Church property in 1917. These earlier efforts were credited with showing crude oil testing 35 degrees gravity before they were destroyed by fire. Western Empire is yet to reach critical levels with the No. 1 well. Another Sespe test is Hi-Ko Oil Company's No. 1 on Section 19-5n-19w.

PALCOTAN

NOW – After five years of research and development, this chemical product, manufactured by the Pacific Lumber Company and derived from California redwood trees, is available as a more economical and more efficient viscosity and gel strength additive for your drilling mud.



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Camp Cooke Test Picks Up Showing

On a 5000-acre lease block in the southern portion of the Camp Cooke military reservation in Santa Barbara County, the Stansbury-Webb and George J. Greer, Trustee, Spanne No. 1 wildcat on Section 16-6n-35w is credited with showings on the ditch around 1800-1900 feet. The project is at present well below that depth. Location is on a farm-out from M J M & M Oil Company, which retains a 50 per cent working interest in the land and subject to a 20 per cent net profits claim payable to others. In the Goleta area, Sunray Oil Corporation's Bishop No. 1 wildcat did a fadeaway at an even 3300 feet. The company's Stow No. 1 on the same section, 7-4n-28w, is drilling at 2600 feet. Near Lompoc, Chieftan Oil Company's Chieftan-Larsen Bros. No. 1 exploratory hole on Section 19-6n-34w is all set to begin drilling.

Guadalupe Well Reported Sanded Up

South of the Guadalupe and north of the Santa Maria field, Union Oil Company's newest well in that part of the coastal region has sanded up. Known as No. 52-17 and located in Section 17-10n-35w on the sizable Union Sugar lease, the well started off from a total depth of 4770 feet for more than 100 barrels a day. However, the latest check revealed production just before sand interfered was 42 barrels of 13 gravity oil, cutting 88 per cent, and 30,000 cubic feet of gas daily.

Sacramento Valley Coreholes Drilling

Humble Oil & Refining Company is moving ahead with work on a series of coreholes mapped out between Lodi and Sacramento. The entire slim hole campaign calls for digging no less than 20 jobs in an area bounded on the south by Lodi and on the north by Red Bluff. It is not expected that holes will be taken down below 2500 feet in gathering information of geological value to in turn lead the way to full-scale exploratory work. North of the San Ardo field, Humble's A. J. Zabala No. 1 wildcat is drilling below 6000 feet on Section 34-18s-6e, Monterey County. Location is northwest of Greenfield townsite.

Risk of check valve failure is counted in dollars spent for string pulls, and dollars you can't spend because of lost production. Kennametal Balls and Seats give you excellent insurance for this risk because they resist shock, sand-cutting, corrosion, and pitting up to 5 times as well as "special" check valves. Most well-known pumps use Kennametal Balls and Seats as standard equipment.
Kennametal Balls and Seats (either flat or rib type) are sold by your regular supplier, in A.P.I. specifications. Kennametal Inc., Latrobe, Pa.

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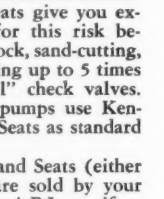
Made of corrosion-resistant titanium carbide, ⅓ lighter than steel. Minimizes down-well check valve trouble caused by ball flutter, cage wear, and fluid pounding.



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PUTS AN END TO DOWN-THE-HOLE CHECK VALVE TROUBLE

Yolo County Listed For Additional Work

Although Ohio Oil Company has yet to chose definite location for a new wildcat well in Yolo County, it is generally agreed that further exploration will be carried out in the near future in territory around Chicahominy, northwest of the Pleasant Creek gas field. It happens that a year ago Ohio took a gamble and drilled on the Rominger property for a gas well reward. The success was followed by the drilling of another well, which gave up nothing but dust resulting in a temporary recess to the play. General Petroleum has skillfully cleaned out drill pipe stuck in its Glide-Court No. 1 project in the Saxon area to very near present bottom of the well at 12,638 feet and drilling resumption is imminent. Located in Section 10-7n-3e, it would surprise no one if the wildcat eventually would attain a depth beyond any previous try in the area.

Arroyo Grande Attracts Test

An interesting test is at the primary operational stages on land about three quarters of a mile northeast of the Arroyo Grande field in San Luis Obispo County. It is sponsored by Western Empire Petroleum Company and location is on Section 29-31s-13e. At Morro Bay, Tide Water Associated's Montadoro No. 1 on Section 3-31s-10e keeps drilling at 3000 feet or thereabouts. Merchants Petroleum Company is understood to hold a stake in the Morro Bay play.

Martinez Wildcat Starting Operations

Lightning Gas & Oil Company of San Jose is bent to uncovering new production with a well tagged Almond No. 5 and staked on Section 31-2n-2w, southwest of Martinez, Contra Costa County. E. E. Chase Jr. is president, W. W. MacKall, vice president, and John L. Smith, secretary-treasurer. The engineering is in the hands of Easton & Sacre.

Petrolia Wildcat Going Deeper Down

At Petrolia in Humboldt County, West Coast Oil Corporation is deepening from 1785 feet to around 2200 feet its West Coast No. 1 wildcat test on Section 21-1s-2w. The project was originally finaled last October at the shallower depth for something like 10 barrels of high gravity clean oil a day. The rig for the new operations was moved from Mattole Oil Company's Chambers No. 1 on the section, idle at 625 feet.

Liberty Cut Lists Wildcat

As a natural sequence to its gas discovery scored last November, Arcady Oil Company is all set to take down its Fahn No. 2 wildcat in the Liberty Cut area of Solano County. The drill site is slightly more than 1300 feet southwest of the Fahn No. 1, drilled to 5000 feet and completed from the interval of 4128-4138 feet for a potential yield of 5,000,000 to 6,000,000 cubic feet of gas a day.

Las Posas Test Suspends Drilling

All trials of Sunray Oil's Fasshauer No. 1 wildcat on Section 5-2n-20w in Ventura County's Las Posas area failed to measure up by a long shot and operations have stopped at 10,060 feet. The contract rig has been released.

Conejo Oil Try Water Conversion

Having taken down its Janss No. 1 wildcat to 8151 feet and then redrilling to 4215 feet without coming across the desired oil, Richfield has converted the project to a dispenser of water for the lessor on Section 36-2n-20w, Ventura County.

Bardsdale Well Opens Operations

Bill Tomberlin, a recent newcomer from Denver, who during the past year accounted for the discovery of three new fields in the Rocky Mountain region, has started Beryl-

Prevent fishing jobs
Pull bits at the critical point
Know change of formation —
check trouble with the

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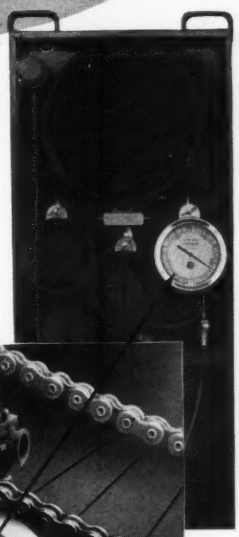

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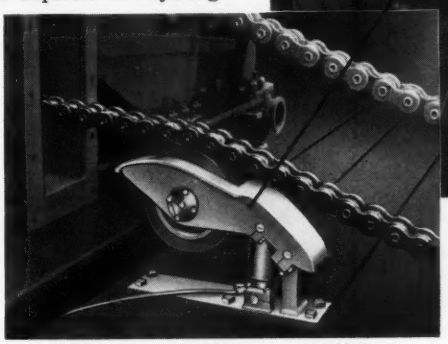

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wood No. 1 on the west side of the Located on Section 12-3n-20w, the Bardsdale field in Ventura County. project is understood headed for some 7500 feet.

Hopper Canyon Well Inactive

Still idle at 2455 feet, Palomino Oil Company's next move with its Palomino-United No. 1 well on Section 13-4n-19w in the Hopper Canyon field is yet to be announced. At Elwood, Pacific Western is the operator taking down Blue Goose No. 93-12 well on State Lease 420.

Lomita Wildcat On Drilling Way

Lomita is the setting of an important wildcat drilling for Seaboard Oil Company on Section 35-4s-14w and no great distance from the intersection of Pennsylvania

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avenue and the Pacific Coast highway. As relates to the Torrance field, the well is only about one and one-half miles south of wells producing there. The well is called Seaboard-Bandini-Sidebotham No. 1. The test is viewed generally as a good shot for production and success probably would not occasion much surprise.

Orange County Wildcat Drills

The C. D. Cunningham, Operator, Plavan No. 1, a designated 6000-foot test on Section 1-6s-11w at North Newport Beach in Orange County, is digging in the shallower formations. Location is near the intersection of Adams street and Cannery avenue and between fields at West Newport and Huntington Beach. Murphy Bros., Ltd., and A. D. Rushing, Inc., have abandoned their Brown-Henricksen No. 1 test on Section 11-6s-11w at Huntington Beach at 5039 feet. In the nearby Talbert area, D. D. and Dorothy Dunlap appear to have a nice well with Lamb No. 1 on Section 6-6s-10w. The well, bottomed around 5400 feet, cored first oil sand near 4750 feet. Back at Huntington Beach three test wells in the earlier stages are Southern California Petroleum's Gerhart No. 1 on Section 11-6s-11w, Behr Oil Company's P & V No. 1 on Section 14-6s-11w, and Wilson Oil Company's Mills No. 1 on Section 13-6s-11w. The James Ebert and Edward Nepple, Aldrich Land No. 1-1 wildcat on Section 1-6s-11w is being taken down by U. S. Drilling Company at a depth last reported 800 feet.

West Newport Field Active

Among wells drilling in the West Newport field is W. E. Burnett's Burnett No. 1 on Section 13-6s-11w. It is down 3000 feet or more. Eddie Fisher, who came from Brush, Colorado, some months ago to enter the California industry, is testing his Newland No. 11-12 well on Section 12 in the field. Fisher is credited with much important development of petroleum in the Rocky Mountain region and elsewhere. No gauge has been reported to date on the Kraemer Oil Estates' new Kraemer Fee No. 1-26 producer on Section 36-3s-9w in the Richfield field, completed at 2612 feet. Two other drilling jobs are going at Richfield at present.

Aliso Canyon Test In Sight

Charles W. Teater and J. K. Wadley are not expected to lose much time in taking down a wildcat well in the Cascade-Aliso Canyon area, where they hold an 1180-acre lease block. Actual initiation of the project will await formal district zoning by the Los Angeles Planning Commission. Three wells currently are drilling in the Aliso Canyon field under the auspices of Tide Water Associated, Standard Oil and Porter Sesnon et al.

Universal Test Redrilling Ahead

Universal Consolidated Oil Company is redrilling at 6500 feet with its second test well on the Twentieth Century-Fox studio property in the Beverly field. The project the first time down went to 8846 feet and the redrill resulted from a fishing intrusion. No. 1 test was completed some months ago at a depth approximating 7000 feet and is shut in awaiting installation of the proper facilities to handle produced oil.

San Fernando Wildcat Digs

Seeking further possible development of old mission lands near San Fernando, Standard is drilling at an intermediate stage with its Mission No. 5-3 wildcat venture on Section 2-2n-16w, Los Angeles County.

Castaic Creek Test Proceeds

Of considerable interest is Gene Reid Drilling Company's General American No. 81-13, a designated 4500-foot test on Section 13-5n-17w near Castaic Creek. The project is drilling at location a half mile west of T & M Exploration Company's Kinler No. 1, abandoned at 2877 feet in September of 1952 after pumping some oil, but not enough. Doug Marcell is handling engineering on the brand new test.

Yucca Valley Wildcat Working

Some 1300 feet is the depth of Tampico Land Development's Reari No. 1 exploratory well drilling on Section 25-2n-5e in Yucca Valley, San Bernardino County. Over near Palm Springs in Riverside County, The Texas Company's Stone NCT-1 No. 1 wildcat on Section 35-3s-5e atop Edom Hill is drilling at 6900 feet, plus or minus. Nothing of interest has been reported from the wildcat to present level. In the San Timoteo Canyon area, still idle is S. V. Smith's Haskell No. 2 test on Section 35-2s-2w at 520 feet.

Anaheim Project Drilling Deeper

Northeast of the town of Anaheim in Orange County, The Texas Company's Ruff No. 1 wildcat well was last reported digging not far above 5000 feet. Pike Drilling Company is doing the chores. The company's Olive Unit Two No. 1 on Section 7-4s-9w in the Olive area is going down under the supervision of Dunlap & Graham, contractor, at 4100 feet.

Castaic Hills Well Scheduled

On its Villa lease at Castaic Hills, Standard is preparing to take down its No. 26 well on Section 35-5n-17w, with International Drilling Company in charge. Richfield's Moran No. 32-35 on the section has come in on the pump from a redrilled depth of 5551 feet for several hundred barrels a day.

Pumper In At Santa Fe Springs

Near Clark avenue and Ward street in the Santa Fe Springs field, Standard's Walker No. 27 has been completed at 7905 feet. Located on Section 6-3s-11w, the well started off showing all wash oil, but on the latest check was putting out 138 barrels of oil a day, cutting 30 per cent. Ridge Hill Oil Company's Baker No. 1 on Section 5 is idle after redrilling to 8038 feet. It went the first time to 8157 feet.

Sansinena Field Continues Successes

Union Oil Company, which has a half-dozen rigs busy in the Sansinena field, has just completed its No. 8-B-6 there at 5375 feet for 66 barrels of oil a day and 80,000 cubic feet of gas to boot. Company operations in this area have been highly successful and have encroached never a whit on the ineffable beauty of the countryside.

Rosecrans Field Well On Production

From the Rosecrans field comes word of the completion of Atlantic Oil Company's Sutherland No. 1 on Section 18-3s-13w. Yield from 8070 feet was reported only 10 barrels daily.

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Tejon-Reserve Area Adds New Pool Find

"It may turn out to be a significant new pool discovery, but the extent cannot be accurately determined until additional wells are drilled." Thus termed by Jasper W. Tully is Reserve Oil and Gas Company's new achievement with its Reserve-Pauley No. 42-34 test on Section 34-11n-19w in the Tejon-Reserve area of Kern County. Tully added that "analysis of the cores was most encouraging, pressures are excellent, and all indications point to this being a discovery well of importance to Reserve." Competent observers are in accord with conclusions drawn by the oil executives on the well, which on test of the Lower Valv in the Olcese sand sprang to life with a yield of more than 1000 barrels of clean 26.7 gravity oil a day. Bottomed and completed at 5744 feet and still in the zone, subsequent wells will be called upon to ascertain full thickness of oil sand at this location. This particular sand in past operations in the area generally has not been tapped because the discovery well went deeper than any other venture ever taken down in the vicinity. On the east side of San Joaquin Valley, the Olcese has been a stellar performer from a production aspect in a number of areas. Reserve holds much ground in the area and in the play just crowned with success, Edwin W. Pauley shares interest with the former in a substantial tract.

Lost Hill Area Takes On Testing

Union Oil Company has launched a new investigation of production chances on land about three miles northwest of the Lost Hills field. The inquiry is moving ahead at an early stage through the medium of Seaboard-Saunders No. 63-29 wildcat on Section 29-25s-20e. Not many months ago the area was the setting of wildcat operations carried on respectively by Tide Water Associated, Universal Consolidated Oil Company, General Petroleum Corporation and Superior Oil Company. As Lady Luck would have it, Tide Water was the only operator to woo and win fortune with its Farns-

worth No. 14-17, which began all right but appears at this time to look neither a good or bad producer, just trivial. Union by going deeper may unlock an oil storehouse more in keeping with economy. Some miles north of the Tejon field, Union has abandoned its Reserve-Tejon No. 57-26 on Section 26-11n-19w at 10,370 feet.

Temblor Range Oil Hunt Opens

At Temblor Range, a dozen miles northwest of McKittrick, Seaboard Oil Company has spudded-in its Government No. 34-4 wildcat on Section 4-30s-20e, or just a few miles southwest of the old Temblor field, more than a half-century in age and still able to put out some oil. On Section 12-30s-20e, Pacific Western Oil Corporation's Hagood No. 43-12 wildcat keeps carving deeper under 2000 feet. Beside Seaboard, Southern California Petroleum and St. Anthony Oil Company hold stakes in the play.

Mount Poso Test Work Commencing

Moving toward conclusions is Tri Party Production Corporation's Lucky No. 1 wildcat on Section 36-26s-27e, northwest of the Mount Poso field. The Texas Company has added to its San Joaquin Valley holdings by acquiring 610 acres west of the field on Section 19-27s-28e. It was taken on assignment from Bradford Bishop.

Equipment Changed On Shafter Wildcat

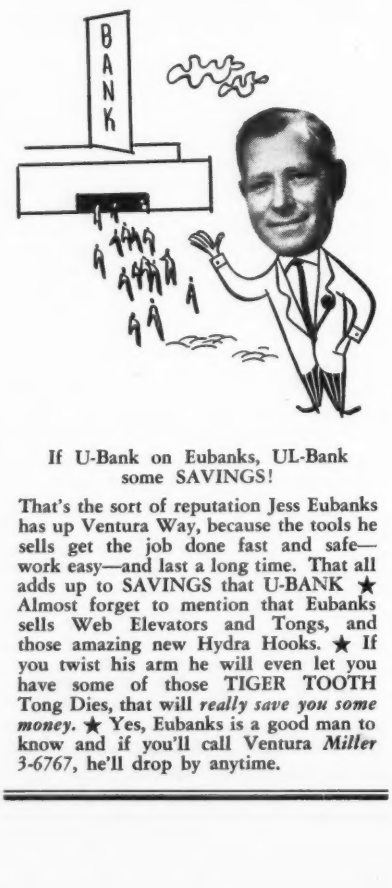
Having changed over to heavier equipment, Superior Oil Company has resumed drilling at 5240 feet with its Russell No. 73 test on Section 17-28s-25e, one mile west of the town of Shafter and about the same distance east of Tide Water Associated's abandoned 12,563-foot project. The duster picked up good showings of gas, but very few signs of oil. Approximately 1900 feet northwest of Tide Water Associated's first try, the company's Stone No. 1-18-1 on Section 18-28s-25e is working with the drill in the relatively shallower formations.

Mountain View Venture Drilling

In the central part of the Mountain View area, M J M & M Oil Company of San Francisco continues to drill steadily ahead below 5000 feet with its Union-Atlantic-Wilson No. 18-20 test on Section 20-30s-29e, with Clyde Hall Drilling Company in charge.

Belridge Tried For Secondary Oil Recovery

New to the production industry is a secondary recovery method being given a try out by General Petroleum Corporation in a lone and separated pool in the South Belridge field. The new system of recovery underwent a primary test in a small way in Oklahoma and is known as In-situ combustion. In practice, oil sands are literally set afire to force hydrocarbons in advance of the blaze and thus give production impetus to wells. General Petroleum at this time is taking down a trio of core holes on Section 3-29s-21e in the field and cores will be forwarded to a Dallas research organization for further analysis and determination as to whether wells in the sector would be readily adaptable to the fire treatment in coaxing out more oil to the surface. A 700-foot sand is on trial.



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Eocene Test Drills Ahead

Southern California Petroleum Corporation's interesting USL No. 45-18 wildcat test on Section 8-30s-21e in the northwest Belgian Anticline area is drilling underneath the 1500-foot level. The well is aimed for a look at the Phacoides, Oceanic and Point of Rocks sand in the Eocene formation. Contractor is Camay Drilling Company.

Alferitz Wildcat About To Spud-In

Carlton Beal & Associates are just about ready to spud-in Miller-Bump No. 6 test on Section 11-25s-18e in northeast Alferitz Anticline territory. This is the company's initial followup well to the discovery uncorked last December. Location is some 2000 feet west from Kalloch No. 56-11 finder, completed for a primary flow of 570 barrels of 31.5 gravity oil daily from intervals between 4590-4865 feet. Targets are sands in the Point of Rocks and Canaos zones. Gilliland Oil Company ond H. F. Ahmanson have completed their third producer in the new Eocene pool at nearby Dagany Gap. West No. 1 on Section 3-25s-18e, a west offset to the initial producer, came in from 1893 feet with an initial yield comparable with earlier successes. The second well, Alferitz No. 6-A on Section 10-25s-18e, is producing at the rate of 160 barrels of 27 gravity oil a day through a 16/64-inch bean from a total depth of 1905 feet. The Point of Rocks was topped at 1167 feet. New leasing in the vicinity included the acquisition by The Texas Company of 320 acres on the west half of Section 4-25s-18e or about one mile west of the Gilliland-Ahmanson discovery well, tagged Miller No. 1.

Edison Test Proves Duster

A total depth of 6300 feet writes finish to Standard Oil's Jeppi No. 4 test on Section 17-30s-29e in the

Edison area. The unproductive Nozu zone was topped at 6035 feet and it continued appearance to 6252 feet.

Union Completes Guijarral Producer

Union Oil Company has completed its fifth producing well in the Guijarral Hills field of Fresno County and within the near future is expected to add the final touch to a couple more. Bell No. 4-26 on Section 26-20s-16e was drilled to a bottom of 8936 feet and came in from three intervals perforated between 8696 and 8873 feet for an initial flow of no less than 1800 barrels of clean 38.2 gravity oil a day. This is the most northerly well producing in the field, which was born last January. The F. W. Taylor, Operator, No. 34 Guijarral Hills test on Section 10-20s-16e has been given up at 9146 feet. Brown Drilling Company, contractor, is ready to begin drilling Shell Oil's Imperial No. 323X-4 test on Section 4-19s-15e, northwest of Coalinga.

Fern Canyon Wildcat Digs

At Fern Canyon, two miles west of Paso Robles, Intex Oil Company's Sauret No. 1 wildcat well continues to dig on down below 1000 feet. Located on Section 25-26s-11e in San Luis Obispo County, the well is not likely to go beyond 2000 feet for a test of the Vaqueros. In addition to Intex, Wilrich Development Company holds a stake in the play, which spreads over 1000 acres. Cardinal Drilling Company has a contract rig working at 800 feet with Neaves Petroleum Developments' Neaves-Elkhorn No. 3 explorer on Section 23-32s-22e at Temblor Hills. In the South Carrizo area, Elmer C. von Glahn & Associates' Washburn No. 1 wildcat is being deepened from 1373 feet, following a test just off that depth which showed no rise.

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Tulare County Adds Drilling

The growing drilling campaign in Tulare County includes a new test well preparing to start under the banner of Navy Oil Company, Inc., on Section 9-22s-27e in the Porterville area. Five and one-half miles southeast of Corcoran, C. W. Colgrove's Green No. 48-26 on Section 26-21s-23e is down 550 feet and moving in heavier equipment. Roberts & Avery's No. 1 well on Section 15-22s-27e at Terra Bella is designed for production around 800 feet.

Black Canyon Wildcat Quits

Standard has pulled out of its Eade No. 27-35 exploratory well on Section 35-18s-9e at Black Canyon, San Benito County. Showings encountered were all of minor significance. In the Ciervo area, Harry L. Barnett is all set to rework Ashurst No. 1 wildcat on Section 27-16s-11e. The project was carried originally to 1676 feet by The Texas Company as Ashurst One No. 1.

Kings County Test Drilling

Drilling has reached 8200 feet in Palm Oil Company's Kochergen No. 1 wildcat venture on Section 2-22s-18e at Kettleman Hills North Dome, Kings County. Petri Drilling is doing the work.

McDonald Anticline Well On Production

New laurels have been won by Ferguson & Bosworth of Bakersfield by completion of the old abandoned Independent Exploration Company well known as Anderson No. 0-1 on Section 19-28s-20e in the McDonald Anticline field. Originally drilled to 2500 feet and forsaken, Ferguson & Bosworth deepened the well to 3936 feet and set a bridge plug at 2390 feet. After perforating at three intervals from 2331 to 2367 feet, the well produced at 146 barrels a day rate of 32.2 gravity crude oil.

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The Fundamentals of Hdrafracturing

(Continued from Page 5)

Summarizing, it would seem that the current variations of the Hydrafrac process constitute a fully effective means of increasing the yield of oil from tight sands. Wide use of the process has in the great majority of cases met with marked success. The conduct of the operation, however, must be preceded by complete rationalization of all available data as to subsurface formations and the mechanical condition of the well. Accumulated experience to date is sufficient to assure the operator that in the hands of competent and qualified engineers the process involves little hazard either to the well or to the operating personnel. Laboratory and field studies of hydraulic fracturing over the past five years have been paralleled by mixing and injection equipment studies, and the mechanical hook-ups now engaged in this highly specialized enterprise are more than adequate to perform their function speedily, efficiently, and safely.

Chowchilla Gas New Test Target

Just opening work is Claude Clayton's Clayton No. 1 wildcat project on Section 5-10s-14e in the Chowchilla gas area of Madera County. The well is being taken down under contract with Santa Fe Drilling Company.

Merchants Reports 1953 Net Earnings

Merchants Petroleum Company of Los Angeles for 1953 reported net profit of $7621. Net for the year preceding was $19,159. A substantial increase in expenses resulted from broader geological and exploratory activities, according to C. P. Watson, board chairman, and Grant W. Corby, president.

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Patient: "Baseball."

Psychiatrist: "Don't you dream about anything else?"

Patient: "Nope just baseball, night after night."

The doctor looked puzzled. "Don't you ever dream about a pretty girl?"

Patient: "What? And miss my turn at bat?"

Grandpa Watkins was sort of absent-minded, so his wife wasn't too surprised when he came in from a walk to the post office and announced that he guessed he'd lost his umbrella. "When did you first miss it?" Granda wanted to know.

"Just now," replied Grandpa, "it stopped raining and I reached up to put it down and it wasn't there."

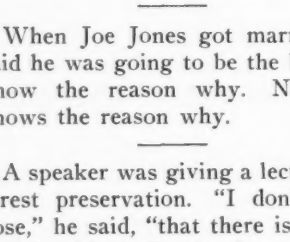
Little Boy: "C'mon in and see my new watch dog."

Pal: "What's he watch?"

Little Boy: "Television."

The old Colonel had put in forty long years under Army routine, and now he was being retired. He took his old orderly with him as a servant and gave him explicit instructions:

"Now, John, each morning at five o'clock you wake me up and say, "Time for the parade, sir,' and then I'll say, 'Damn the parade!' and turn over and go back to sleep."



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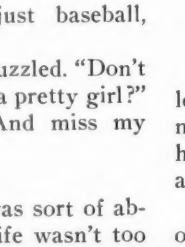

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